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# The Design of Inner Tubes

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THE use of rubber in the construction of hollow inflatable articles calls for special treatment in the design as well as in the methods employed in fabrication. Possibly the most important article of this character is the inner tube; and although a large amount of work has been expended in compounding, in production methods, and in technical control of the product, it is also apparent that the design has been open to much empiricism.

In designing a tube for a given tire four important variables are under the control of the designer: namely, tube diameter, tube length, gage of uncured stock, and quality of compound. With suitable stock gage and quality a tube which is too large will tend to buckle and pinch when inflated in the casing, and a small tube will be caused to stretch excessively.

The practice of using a single tube in two or more tire sizes has rendered desirable a closer attention to design; it is obviously necessary for the tube to fit without buckling the smallest competition tire in the smallest size in the group and to fit without undue stretching the largest tire in this same group. Suitable designs may involve a long tube of small diameter or a short tube of relatively large diameter, and it is the ratio of tube diameter to length which is of controlling importance; neither can be determined independently. A mathematical analysis of the stresses and particularly the strains in inflated inner tubes is necessary if tube design is to be put on a rational basis. Such an analysis is presented below, together with notes explaining special applications of the method.

When an elastic body is stretched, the rate of change of lateral strain with longitudinal strain is termed Poisson's ratio. Experimental determinations of this ratio for rubber show it to be very nearly 0.5, although it has been found to vary somewhat on either side of 0.5 when measured in two directions at right angles in the same sheet. This value of 0.5 corresponds to a material having no change in volume on distortion. The assumption of constant volume with distortion may be assumed to be sufficiently accurate for purposes of this analysis.

Consequently, for a unit cube of rubber,

$$l=(1+a)(1-b)^2 \qquad (1) \qquad \text{or} \qquad \frac{b}{a}=\frac{1}{M}=\frac{1}{2}\left[1-\sqrt{\frac{1}{1+a}}\right] \qquad (2)$$

where a = longitudinal strain = extension per unit length,
b = lateral strain = contraction per unit width,
$\frac{1}{M}$ = ratio of total lateral strain to total longitudinal strain (sometimes confused with Poisson's ratio, to which it is not equal).

Within the elastic limit a stress intensity $p_1$ will produce a strain $s_1$ in its own direction such that $s_1=\frac{p_1}{E}$ where E is Young's modulus, and provided there is freedom for lateral contraction. The contraction in all directions at right angles to the stress will be $\frac{s_1}{M_1}=\frac{p_1}{M_1 E}$

If at a point in an isotropic material (i.e., one having the same elastic properties in all directions) there are three principle stresses of intensities $p_1$, $p_2$, and $p_3$, each will independently produce the same strains as if acting alone. Therefore the total strain S in the direction of $p_1$ will be

$$S=s_1-\frac{s_2}{M_2}-\frac{s_3}{M_3} = \frac{p_1}{E}-2\cdot\frac{1}{2}\sqrt{\frac{1}{1+s_2}}+\sqrt{\frac{1}{1+s_3}} \qquad (3)$$

$$= \frac{p_1}{E}-2\cdot\frac{1}{2}\sqrt{\frac{E}{E+p_2}}+\sqrt{\frac{E}{E+p_3}} \qquad (4)$$

This equation may, of course, be rewritten for the other two directions taken at right angles. If one stress is compressive, the sign of that strain or stress in Equations (3) or (4) becomes negative.

### Application to an Inflated Inner Tube

Let T, S, and N, shown in Figure 1, represent the total strains in each of the three directions[3]: (1) tangent to the cross-sectional perimeter of the tube, (2) tangent to the large perimeter of the tire, and (3) normal to the tube surface. Similarly, t, s, and n will denote the fractions of T, S, and N, respectively, due to the separate stresses in the three directions. Then from Equation (4), $T=t-2\cdot\frac{1}{2}\sqrt{\frac{1}{1+s}}+\sqrt{\frac{1}{1+n}}$ (5)

The value of $p_0$ is small and is approximately equal to the air pressure required to fill out the tube against the casing. Both $p_0$ and n will be constant at all points in the tube. Similarly the stress in the direction of the cross-sectional perimeter of the tube will be constant, as will be t. Hence $T=C_1+\sqrt{\frac{1}{1+s}}$ (6) where $C_1$ is a constant. Again, $S=s-2\cdot\frac{1}{2}\sqrt{\frac{1}{1+t}}+\sqrt{\frac{1}{1+n}}=s+C_2$ (7)

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[3] For meanings of symbols, see also Table of Nomenclature.

Combining Equations (6) and (7),

$$T = C_1 + \sqrt{\frac{1}{1+S} - C_2} = C_1 + \sqrt{\frac{1}{S+C_3}} \quad (8)$$

where $C_3 = 1 - C_2 = 3\sqrt{\frac{1}{1+t}} - \sqrt{\frac{1}{1+n}}$ (9)

Now $C_1 = t - 2 + \sqrt{\frac{1}{1+n}}$ (10) whence

$\sqrt{t+1} = \left[C_1 + 3\sqrt{\frac{1}{1+n}}\right]^{\frac{1}{2}}$ (11) by combining Equations (10) and (11), $C_1 = \left[\frac{1}{3 - C_3 - \frac{1}{1+n}}\right]^2 - 3 + \sqrt{\frac{1}{1+n}}$

and since the strain caused by the stress normal to the surface of the rubber is negligible compared to unity, this becomes $C_1 = \left[\frac{1}{2 - C_3}\right]^2 - 2$ (12) which is the necessary relation between $C_1$ and $C_3$.

The total strain in the direction of the large perimeter of the tube depends only on the length L of the tube and on the distance D/2 from the hub to the point considered. D represents the diameter of a circle passing through the point considered in the tube, and having the hub as a center.

Obviously $S = \frac{\pi D - L}{L} = \frac{\pi D}{L} - 1$ (13)

Hence, from Equation (8)

$$T = C_1 - \sqrt{\frac{1}{\frac{\pi D}{L} - 1 + C_3}} \quad (14)$$

and since the relation between $C_1$ and $C_3$ is known, it is evident that both S and T may be calculated for any position in a tube if the value of $C_3$ is known. Figure 2 shows a plot of T vs. D/L for various values of $C_3$, calculated using Equations (14) and (12). A single curve of S vs. D/L based on Equation (13) is shown on the same figure.

The condition fixing the value of $C_3$ is that the weighted mean average T shall be equal to the average T as found from the equation $T_{av} = \frac{P - \pi d}{\pi d}$ (15)

where P is the cross-sectional perimeter of the inside of the casing, and d is the tube diameter. This relation may be written $\frac{2}{P}\int_{D_r}^{D_o} T\,dP = \frac{P - \pi d}{\pi d}$ (16) where $D_o$ is the large diameter of the tread, and $D_r$ is the diameter at the rim. In order to evaluate this integral it is first necessary to obtain the relation between P and D. This may be done by tracing the outline of the inner perimeter of a sample section of the casing and measuring the distance from the center at the rim along this line to points representing different values of the large diameter D.

The application of this method is illustrated in Figure 3. By assuming a value of $C_3$, T may be found from Equation (14), and the integration performed algebraically. For example, Table 1 shows the necessary computations involved in such a calculation for the case of the 32 by 6.00 casing, for a tube having a net length of 80 inches, and using an assumed value of $C_3$ of 1.1. The range in D from $D_r = 20$ inches to $D_o = 31$ inches was split into eleven sections having the mean values of D tabulated. The fraction of the total inner perimeter of the casing falling in each section was obtained as outlined above. T was then

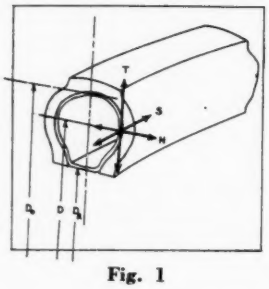



**Fig. 1**

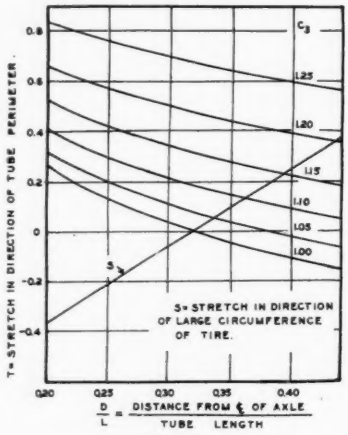



**Fig. 2**

calculated, and the sum of the products T × P represents the value of $T_{av}$ corresponding to $C_3 = 1.1$ for this casing and tube length. The tube diameter d corresponding to this value of $C_3$ may be obtained from Equation (15). It is possible to repeat this calculation and so obtain a curve of $C_3$ vs. $T_{av}$ which will hold for any casing and tube length. This may then be used to obtain $C_3$ for any tube diameter, and T and S for any point in the tube are then found from Equations (14) and (13).

The reduction in gage at various points in the tube is perhaps the quantity of most general interest. This is found from T and S since the volume of the rubber remains constant, i.e., $1 = (1+T)\,(1+S)\,(1+N)$ whence

$$N = -\frac{S+T+ST}{1+S+T+ST} \quad (17)$$

The values of $N_o$ and $N_r$, the fractional change in gage at the tread and at the rim, respectively, are shown plotted vs. tube diameter d in Figure 4, for the case of the 32 by 6.00 balloon mentioned. This figure brings out the very appreciable thinning of the tube, especially at the tread, for tubes of small diameter or length. It may be noted that $N_r$ becomes positive for large long tubes, indicating a tendency for such tubes to kink or buckle at the rim.

### Simpler Approximate Solution

In repeating the calculations outlined above a number of times it was noticed that $T_{av}$ seemed to bear a constant relation to $T_r$ and $T_o$. This can be represented by the empirical equation

$$T_{av} = T_o + 0.42(T_r - T_o) \quad (18)$$

This relation may be expected to hold for casings of other sizes but of similar internal shape as the 32 by 6.00 balloon. Hence it is necessary only to use this relation and Figure 2, or Equations (14) and (18), to find $T_{av}$ for any assumed value of $C_3$. The corresponding value of d may then be found from Equation (15). T, S, and N are then obtained from Equations (14), (13), and (17) once the value of $C_3$ giving the correct d is found.

As mentioned above, the limits of tube sizes are the extremes which will cause excessive stretch at the tread on one hand and buckling at the rim on the other. Limiting the discussion to tubes cured on poles, it may be said that the inflated tube should show no tendency toward increased gage at the rim; in other words $N_r$, the fraction increase in gage at the rim, should never be positive. The optimum condition is to have $N_r = 0$, for the maximum stretch (at the tread) is then at its lowest value compatible with no buckling at the rim. Using the approximate method of solution, values of $T_{av}$ have been calculated and plotted on Figure 5 vs. $D_r/L$ for various values of $D_o/L$ all for the case of $N_r = 0$. The optimum tube diameter d may be found using Equation (15), and values of $T_{av}$ read from this plot.

In employing the method just described the proper choice of the tube length L is uncertain. It, however, was found that

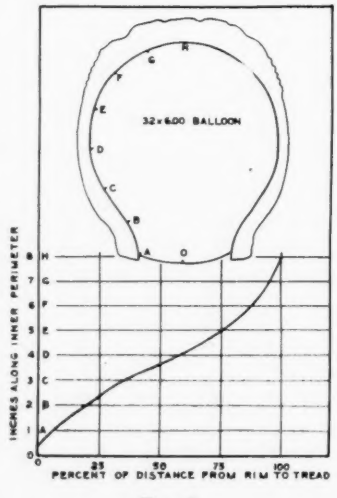



**Fig. 3**

for $N_r = 0$, the fraction reduction in gage at the tread went through a minimum when plotted vs. $D_r/L$. The minimum occurred at $D_r/L = 0.25$ for several different values of $D_o/D_r$; and although the minimum was not a sharp one, the relation $L = 4\ D_r$ may be used as guide in specifying the tube length.

As an example of tube design, assume that it is desired to specify the diameter and the length of a tube to fit the three balloon tires 32 by 6.75, 32 by 6.20, and 32 by 6.00. The important dimensions of these tubes are listed in Table 2. Taking $L = 4\ D_r = 80$ inches, then $D_o/L = 0.391$, 0.388, and 0.376, for the three tires. From Figure 5 the values of $T_{av}$ are found to be 15.7, 15.8, and 16.4 per cent, respectively. The corresponding diameters are found from Equation (15) to be 5.17, 4.87, and 4.38 inches, respectively. Since these represent values of the maximum diameter in each case, the diameter of the tube to be designed is fixed at 4.38 inches. Using this diameter, the values of $N_o$ are found by calculation to be — 0.234, — 0.232, and — 0.217.

TABLE 2
Dimensions of Tires Used in Example

| | 32x6.75 | 32x6.20 | 32x6.00 |
|---|---|---|---|
| Rim diameter, $D_r$, inches | 20.0 | 20.0 | 20.0 |
| Diameter at tread, $D_o$, inches | 32.1 | 31.84 | 30.88 |
| Inside perimeter of casing cross-section, P, inches. | 18.8 | 17.7 | 16.0 |

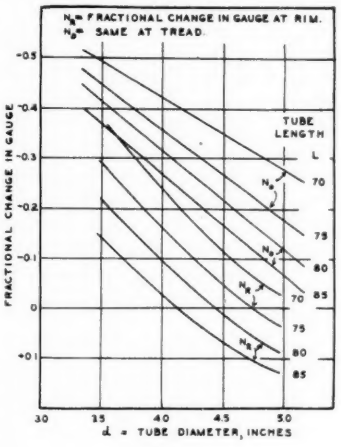



Fig. 4

## Application to Molded Tubes

In the case of tubes built on mandrels and cured before splicing, the tube length L is equal to the perimeter of the uninflated tube, and is the same at the tread as at the rim. In the case of a molded tube the fact that it is cured in a circular mold before inflation in the casing does not change the resulting gage at any point in the tube, and the method of calculating $N_r$ and $N_o$ will not be changed. The method may not be strictly accurate, however, as the stock has some tendency to flow in the mold. During the vulcanization the stresses set up cause permanent strains, and there are no stresses in the cured tube. On inflation in the casing the rubber takes up the same position as it would were it taken directly from the mandrel, spliced, and inflated in the tire. The mold dimensions have, therefore, no bearing on the resulting gage at various points in the inflated tube. (An exception would be the case of a mold larger than the casing.) The mold dimensions have, however, an important bearing on the stresses in the inflated tube, since those stresses are determined by the stretches, not from mandrel to casing, but from mold size to casing size.

Molded tubes are not subject to the restriction that $N_r$ be negative since the gage at the rim may increase during vulcanization without the occurrence of buckling. In fact the tube should be so designed that the cured tube will show a greater gage at the rim than the uncured stock. By so designing the tube the reduction in gage at the tread on inflation may be made very low. From this condition it follows that the molded tube can give on inflation any specified minimum gage (at the tread) with a smaller initial stock gage than can the straight mandrel-cured tube.

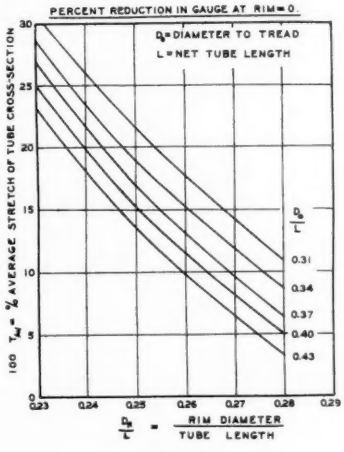



Fig. 5

### Table of Nomenclature

d = diameter of uninflated tube measured to the outer surface.
D = variable diameter from rim to tread with center line of axle as center.
E = effective modulus of elasticity.
L = tube length, spliced = perimeter of uninflated tube.
1/M ratio of total lateral strain to total longitudinal strain.
n = that part of N due to $p_n$.
N = stretch per unit length normal to the surface of the tube = fractional increase in gage.
$p_n$ = stress normal to the surface, per unit of original surface area (approximately equal to the air pressure required to fill the tube out to the casing).
$p_s$ = stress per unit original cross-section in direction of the large perimeter of the tire.
$p_t$ = stress per unit original cross-section in the direction of the cross-sectional perimeter.
P = cross-sectional perimeter of the inside of the casing, or of the inflated tube.
s = that part of S due to $p_s$.
S = stretch per unit length in the direction of the large circumference of the tire.
t = that part on T due to $p_t$.
T = stretch per unit length at any point, in the direction of the cross-sectional perimeter of the tube.
$T_{av}$ = average stretch per unit length in the direction of the cross-sectional perimeter of the tube equals $\frac{P-\pi d}{\pi d}$
Subscript o refers to conditions at the tread, where $D = D_o$.
Subscript r refers to conditions at the rim, where $D = D_r$.

TABLE 1
Sample Calculation for 32 by 6.00 Balloon and an 80-inch Tube. Assuming $C_3$ to be 1.10

| Section No. | Fraction of Casing Perimeter in Section $= \triangle P$ | Average D Inches | D/L | T | T △ P |
|---|---|---|---|---|---|
| 1 | 0.139 | 20.5 | 0.256 | 0.283 | 0.0394 |
| 2 | 0.095 | 21.5 | 0.269 | 0.260 | 0.0247 |
| 3 | 0.094 | 22.5 | 0.281 | 0.240 | 0.0225 |
| 4 | 0.063 | 23.5 | 0.294 | 0.220 | 0.0139 |
| 5 | 0.043 | 24.5 | 0.306 | 0.202 | 0.0086 |
| 6 | 0.042 | 25.5 | 0.319 | 0.184 | 0.0078 |
| 7 | 0.058 | 26.5 | 0.331 | 0.170 | 0.0099 |
| 8 | 0.069 | 27.5 | 0.343 | 0.155 | 0.0107 |
| 9 | 0.076 | 28.5 | 0.356 | 0.140 | 0.0106 |
| 10 | 0.085 | 29.5 | 0.368 | 0.128 | 0.0109 |
| 11 | 0.236 | 30.5 | 0.381 | 0.112 | 0.0264 |
| | | | | Total = $T_{av}$ = | 0.1854 |

## Wanted—New Molecule Set-Up

Many believed that practically the last word about the structure of the rubber molecule had been said when two German investigators announced that researches had indicated beyond a doubt that the caoutchouc particle owed its peculiar elastic property chiefly to a unique spiral, spring-like structure. But the British technologist Whitby cannot coincide with that view at all. Elasticity, he contends, is shown not only by the polymerized monomer of caoutchouc, isoprene, but also by polymers from such widely different molecules as methyl acrylate, styrene, vinyl acetate, sulphurized fatty oils, and by proteins.

# Rosin and Rosin Oil in Rubber and Reclaimed Rubber[1]

H. A. Winkelmann and E. B. Busenburg

OVEN aging of the 60-minute cure at 70° C. (158° F.) for 11 days shows very little difference in tensile strength or elongation between grades M and G gum rosin, pine tar, or blended rosin oil (Figures 1 and 2). In the 90-minute cure (Figure 2) the grade G rosin shows the least, and blended rosin oil the greatest decrease in tensile strength. Except for blended rosin oil, which drops off greatly, the difference in elongation is little. The reason that blended rosin oil ages poorly in the 90-minute cure is the compound has reached its maximum tensile strength in 60 minutes, which is not the case with grade M gum rosin or pine tar. The grade G gum rosin is superior to the blended rosin oil, considering rate of cure, tensile strength, and aging of the two compounds. The aging curve of grade WW gum rosin corresponds to that of grade G gum rosin so that is not shown on the curves.

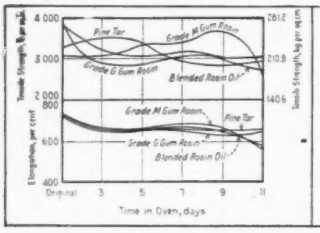



**Fig. 1. Comparison of Softeners in Oven at 70° C. (158° F.), 60-Minute Cure**

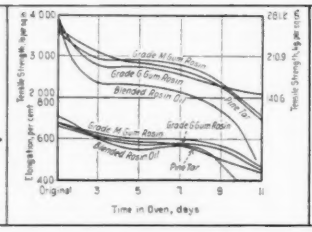



**Fig. 2. Comparison of Softeners in Oven at 70° C. (158° F.), 90-Minute Cure**

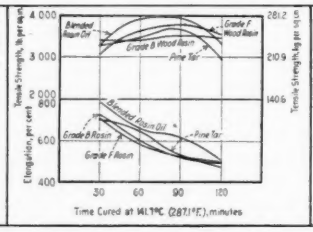



**Fig. 3. Comparison of Softeners**

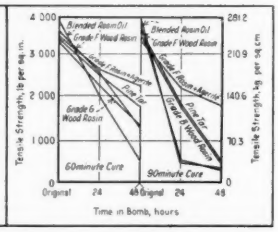



**Fig. 4. Comparison of Softeners in Oxygen Bomb**

The following formula shows a comparison of softeners (Figure 3.)

| | Parts |
|---|---|
| Smoked sheets | 100 |
| Zinc oxide | 5 |
| Sulphur | 4 |
| Softener | 2 |
| Diphenylguanidine | 0.75 |

The wood rosins (Figure 3) do not give such high tensile strength as grades G or WW gum rosin. Grades F and B wood rosin compare favorably in tensile strength and elongation with pine tar and blended rosin oil. The tensile strength for grade I wood rosin lies midway between grades B and F rosin. Bomb aging (Figure 4) shows better results with pine tar on the 60-minute cure, but little difference in the 90-minute cure as compared with the wood rosins. Blended rosin oil shows poorer aging as regards tensile strength and elongation (Figure 5) than wood rosins or pine tar. The addition of agerite powder to grade F wood rosin improves both tensile strength and elongation on bomb aging. The difference is not appreciable in the effect of gum or wood rosins on aging. There is also no practical difference in modulus or reenforcing effect. Oven aging of the 60-minute cure at 70° C. (158° F.) for 11 days shows that grade B wood rosin holds up slightly better in tensile strength and elongation than grade F wood rosin (Figures 6 and 7). The addition of 0.5 of agerite powder improves the aging of grade F wood rosin. In the 90-minute cure grade B wood rosin gives better aging than pine tar, which in turn is better than grade F wood rosin or blended rosin oil. The addition of agerite powder again improves the aging of grade F wood rosin. The aging curves for grade I wood rosin correspond closely to those of grade B wood rosin.

There is very little difference in oven aging between the gum and the wood rosins in the 60-minute cures. In the 90-minute cures there is no difference on aging between the grades G and WW gum rosins and B and I wood rosins. Grade M gum rosin and grade F wood rosin do not age so well as the other rosins, with the latter giving the poorest results. These results show how important it is to judge independently processing and aging of two compounds. Grade G gum rosin and grade B wood rosin give the same relative aging in the oxygen bomb and oven; yet the grade G gum rosin gave one of the softest and least nervy uncured stocks; whereas the grade B wood rosin gave one of the hardest and nerviest uncured stocks. The physical properties of the two uncured stocks are such that they could not be processed alike.

The activation of blended rosin oil compared with pine tar, stearic acid, palm oil, and asphalt in a litharge compound is shown in Figure 8, using the following formula:

| | Parts |
|---|---|
| Blankets | 50 |
| Zinc oxide | 60 |
| Sulphur | 2 |
| Colloidal litharge | 60 |
| Softener | 5 |

The blended rosin oil gives higher tensile strength than liquid asphalt but not so high as pine tar, palm oil, or stearic acid. Oven aging at 70° C. (158° F.) (Figure 9) of the optimum cure of each compound shows that the blended rosin oil compares favorably with the other materials.

A number of years ago A. H. Nellon[2] tried out a series of blended rosin oils in the following compound:

| | Parts |
|---|---|
| Smoked sheets | 50 |
| Brown crepe | 42 |
| Sulphur | 4.5 |
| Zinc oxide | 2.5 |
| Quinoidine | 1 |
| | 100 |

Three parts of various blended rosin oils were added to 100 parts of the above compound. The tensile strength, elongations, modulus, and stress-strain compared favorably

[1] Continued from India Rubber World. March 1, 1931, pp. 63-65.

[2] A. H. Nellon, private communication, Lee Tire & Rubber Co.

with the control and a number of other softeners. Observation of the cures extending over several years showed satisfactory natural aging as compared with other materials.

### Use of Rosin

Rosin may be used in light colored compounds; it does not stain and is odorless. It finds its greatest application in cements, friction tape, and frictions. It is used to increase tackiness and improve processing of rubber compounds. Rosin is used in vulcanizing and non-vulcanizing cements. A vulcanizing cement in which rosin is used to give activation and tackiness is the following:

| | Parts |
|---|---|
| Rubber | 48 |
| Litharge | 18 |
| Sulphur | 2 |
| Grade WW gum rosin | 1.5 |
| | 69.5 |

A large outlet of the non-vulcanizing cement is in the leather and leather shoe industry. Grade WW gum rosin, because of its pale color, is used in shoe laying cement and for joining leather to leather, felt, or fiber. Twenty-five to 50 per cent of rosin based on the weight of the rubber is used. Rosin is peculiarly adapted for use in these cements because it is soluble in both the rubber and the dispersing medium, gasoline or benzol.

Two special wood rosins having melting points of 195 and 112° C. (383 and 233° F.) with acid numbers of 133 and 98, respectively, have found special application in hard rubber.

Rosin oil is used to soften compounds and improve processing. Synthetic rosin oil was used for years in friction compounds before pine tar was used in any volume. Synthetic rosin oil softens and reduces the nerve of a compound.

### Reclaimed Rubber

Rosin and rosin oil have been used in the manufacture of reclaimed rubber by the acid, alkali, and heater processes for many years. They have been used in the devulcanization of all types of scrap rubber such as whole tire, inner tube, solid tire, airbag, hose, etc. Because of freedom from staining, rosin and rosin oil find application in red and gray inner tube reclaims. The absence of odor is also an advantage in treating all types of scrap rubber. Reclaimed rubber containing rosin has, therefore, been used in the manufacture of a large variety of rubber products such as tires, inner tubes, belting, hose of all kinds, tubing, insulated wire, auto topping, boots and shoes, heels, etc. In some products larger amounts of reclaimed rubber have been used. The products have had to meet a variety of tests in service such as heat, steam, fatigue, flexing, sunlight, etc. The presence of rosin or rosin oil on the basis of comparative tests has not been detrimental.

Rosin or blended rosin oil may be added to reclaimed rubber prior to or after devulcanization. Rosin and rosin oil must be used on their own merits in reclaim products developed around them for certain purposes. It is impossible simply to substitute one material for another. For example, if rosin is used in place of pine tar, a slightly firmer reclaimed rubber is obtained; this result necessitates further changes in the devulcanizing process to produce a reclaimed rubber of the consistency obtained with pine tar. Rosin improves the physical properties and working properties of a reclaimed rubber. When adding rosin after devulcanization, it greatly facilitates the milling of the rubber. For this purpose a high melting point rosin without excessive tackiness is preferred.

Rosin or rosin oil used in the alkali process of devulcanization results in the formation of a soap. Some of this soap remains in the rubber, giving a firmer reclaimed rubber which cures with a higher tensile strength and modulus. The presence of the soap will also have a different effect when the reclaim is used in a rubber compound than when rosin, as such, is added to the compound or when an acid reclaim containing rosin is used. All of these factors must be borne in mind in judging the effect of rosin in rubber and reclaimed rubber. The alkali reclaim containing some rosin soap will increase the rate of cure and the modulus of the rubber compound.

Acid reclaims have been devulcanized for years with rosin. Both gum and wood rosins have been used, with practically no difference in results. These reclaims have also been used in the manufacture of a large variety of rubber products.

Heater reclaims, that is, devulcanized in open steam, have been prepared with rosin and rosin oils. These age as well as though pine tar or any other softener had been used, and have been successfully used in all types of rubber goods.

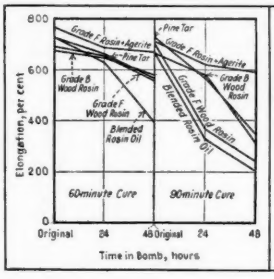



Fig. 5. Comparison of Softeners in Oxygen Bomb

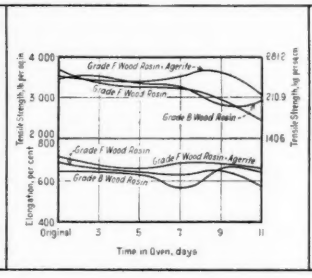



Fig. 6. Comparison of Softeners in Oven at 70° C. (158° F.), 60-Minute Cure

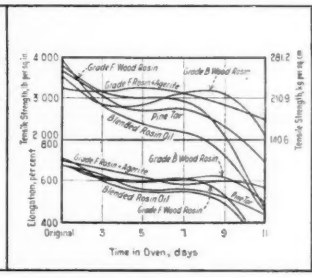



Fig. 7. Comparison of Softeners in Oven at 70° C. (158° F.), 90-Minute Cure

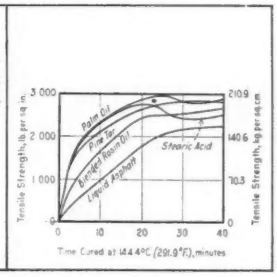



Fig. 8. Comparison of Softeners

### Aqueous Dispersions of Rubber Compounds

Aqueous dispersions of crude and reclaimed rubber have been made with sodium resinate and with rosin or rosin oil and alkali. Patents covering the use of rosin or rosin oil for this purpose have been granted to H. L. Trumbull and J. B. Dickson,[3] T. G. Richards and G. P. F. Smith,[4] H. E. Cude,[5] R. P. Rose,[6] W. B. Pratt,[7] J. H. Reel and H. E. Cude.[8]

Alkali rosin soaps are well adapted for use as dispersing agents in preparing aqueous dispersions of rubber compounds. The soap decreases the interfacial tension and results in the formation of small particles of rubber which are surrounded by the protective colloid. The molecules of soap tend to orient in the interface so that the metallic end, or polar group, is in the water while the hydrocarbon chain, or non-polar group, is in the rubber. The solubility of the

[3] U. S. Patent No. 1,513,139 (1924); and No. 1,668,879 (1928).
[4] U. S. Patent No. 1,671,316 (1928).
[5] U. S. Patent No. 1,680,862 (1928).
[6] U. S. Patent No. 1,680,915 (1928).
[7] U. S. Patent No. 1,732,027 (1929); and No. 1,755,890 (1930).
[8] U. S. Patent No. 1,735,547 (1929).

hydrocarbon chain in rubber and of the metallic portion in water is peculiarly favorable to adsorption at the interface and consequent lowering of the interfacial tension. Rosin speeds the dispersion of rubber compounds in water by imparting tackiness to the compound during the early stages of adding water to the rubber. Oleic and stearic acid produce dispersions more slowly than rosin because they do not impart tackiness to rubber and the non-polar group is not so soluble in the rubber as is true for rosin. M. C. Teague[9] increases the tackiness of water suspensions of rubber compounds by addition of ammonium resinate or ammonium compounds of rosin.

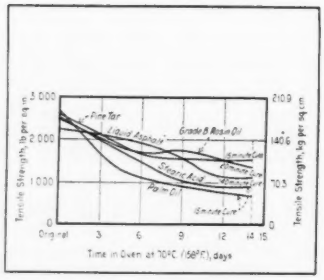



**Fig. 9. Comparison of Softeners, Oven Aging**

Aqueous dispersions of rubber compounds with rosin as the dispersing agent are being used for a variety of purposes. The application of dispersions in the rubber and allied industries has been frequently discussed and need not be repeated here.[10] Aqueous dispersions of reclaimed rubber are proving to be valuable as a compounding ingredient in the manufacture of products from natural latex. The manufacturer of products from latex can use the same materials employed in ordinary rubber manufacture. The presence of the dispersing agent or rosin soap in the product necessitates careful adjustment of the compound for cure and aging. The proportion of rosin soap speeds the rate of cure and increases the modulus. The compound may also cure harder unless changes are made.

### Summary

1. Rosin and rosin oil may be used in rubber with satisfactory results.
2. Rosin and rosin oil may be used in the manufacture of various types of reclaimed rubber for use in rubber products.
3. Gum rosins give more plastic, softer, and less nervy compounds than wood rosin.
4. The higher the acid number of wood rosin, the more plastic and less nervy the compound.
5. Pine tar gives less plastic, harder, and more nervy compounds than blended rosin oil or the rosins.
6. There is very little difference in tensile strength or modulus between gum or wood rosins, blended rosin oil or pine tar.
7. Rosins compare favorably with other materials on aging.
8. Rosin finds wide application in curing and non-curing cements.
9. Rosin may be used with satisfactory results in aqueous dispersion of rubber compounds.

### Conclusion

Rosin or abietic acid is the cheapest available organic acid of high molecular weight. A complete study of the comparative effect of the various gum and wood rosins on plasticity and other uncured properties of rubber compounds would be of value with reference to tubing, calendering, and assembling operations. Their effect in cured rubber under various conditions: namely, oven and oxygen bomb aging, sunlight aging, flexing, and compression would definitely stress advantages or limitations of these materials. A careful study of manufacturing methods coordinated with an evaluation of their effect in rubber products would undoubtedly lead to standardized products which would prove to be of value to the rubber industry. An investigation on the choice of rosin and solvent to be used in the preparation of blended rosin oil and showing their effect in rubber should be made.

A study of the derivatives of abietic acid, such as esters, salts, etc., would bring out some interesting data on products that have not been used. The development of hydrogenated abietic acid or rosin would be welcomed by both rubber and allied industries.

The authors express the belief and the hope that research on rosin in rubber may be stimulated as a result of this paper and that much new data will be contributed to the literature on the advantages of using rosin in rubber compounding.

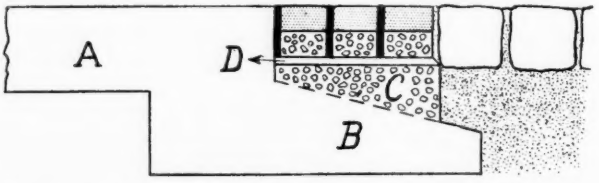
[9]U. S. Patent No. 1,746,875 (1930).
[10]H. L. Trumbull. "Colloid Symposium Monograph," p. 215 (1928). See also H. A. Winkelmann, India Rubber World, Vol. 78, No. 4, p. 53 (1928), for other references.

## A New Use for Rubber Road Blocks[1]

AN INTERESTING development of rubber road blocks has been introduced in connection with the concrete roads on the premises of the new factory of Erven Wed. J. van Nelle in Rotterdam where there are roads in various places around the factory that adjoin the municipal cobble—or clinker—paved roads.

In order to protect the concrete section from impacts caused by traffic and to prevent damage to the edge of the section a supple and resilient transition from the cobble or clinker pavement to the concrete road was considered desirable.

This problem was solved by placing three courses of rubber road blocks betwen the cobble or clinker roads and the concrete road.




**Transition from Cobble Pavement to Concrete Road with Rubber Paving Blocks**

Referring to the picture, the concrete section *A* was extended over a distance of 20 inches by a concrete slab, gradually decreasing in thickness. On this slab a horizontal concrete surface *C*, 16 inches wide, was made on which the three courses of rubber blocks were laid in a cement mortar *D*, 7/8-inch thick. The composition of the cement mortar was 1 : 3. The joints between the rubber blocks, 1/2-inch wide, were grouted in with a bituminous compositition.

The cobbles or clinkers were laid in a sand layer in the usual way. The gradually decreasing thickness of slab *B* allows for a sufficient thickness of the sand layer so that in course of time the first course of clinkers or cobbles can sag slightly with the cobble or clinker road itself, thus promoting a supple transition.

At first this construction was applied at the main entrance of the factory premises. After it had been submitted to the traffic of heavy motor lorries during one year, it proved to be successful in every respect and therefore it has now been applied at all transitions from cobble or clinker pavements to the concrete roads on the factory premises.

[1]*Bull. Rubber Growers' Assocn.*, Nov., 1930, pp. 591-93.

# Features and Functions of Belting

## Factors Determining Belting Quality — Duck and Rubber — Construction and Tests

THE principal products of the mechanical goods division of the rubber industry are belting, packing, and hose. Each of these is made in numerous constructions and qualities to meet diversified service.

Belting probably antedates packing and hose as a rubber product. In its customary form it consists simply of plies of duck united and covered by a vulcanized rubber composition; yet its applications in industry are important beyond estimation. The efficiency of belting depends on its strength and flexibility. These characteristics are due primarily to the weight and weave of the duck; while the durability of the belting depends, in the main, on the adaptability of the rubber composition as an elastic antiaging binder.

The following general remarks on belting materials, construction, and tests are submitted to aid the jobber and the user in the discernment of belting quality.

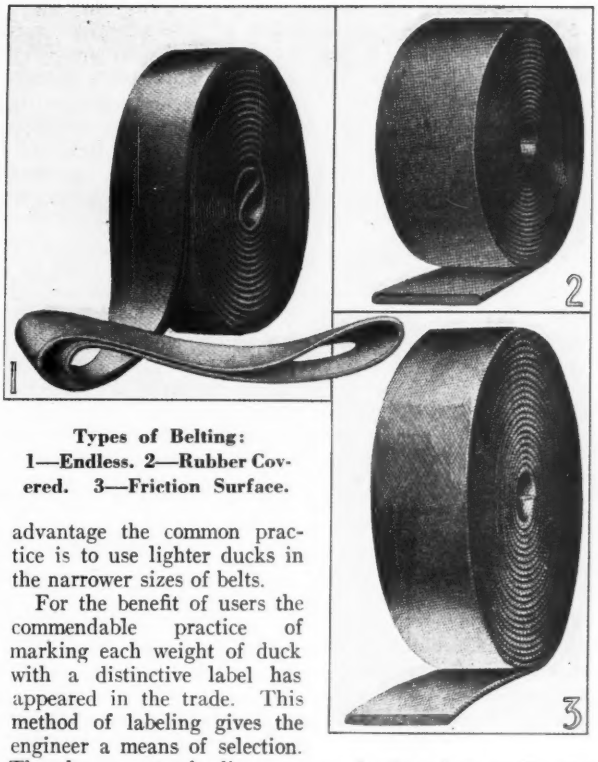
### Belting Duck

Two types of duck, soft and hard, are used in belting construction, of which it constitutes practically 52 per cent of the weight; the remainder is rubber composition. The recognized designation of belting ducks by weight is in ounces per yard of 42 inches width. The weights of soft duck commonly used are 24-, 28-, 32-, and 36-ounce, and of hard ducks 32.7- and 34.4-ounce.

Much more of soft pliable duck than of hard duck is used. The latter type is especially adapted to heavy duty power transmission work. For a comprehensive dissertation on belting ducks the reader is referred to an article by W. L. Sturtevant and J. E. Skane[1] in which these authors discuss the construction, the inspection, and the testing of ducks and the influence of frictioning on fabric strength.

Concerning duck in rubber belting in general it may be said that all degrees of strength and flexibility in rubber belting are obtainable by varying the number of plies and the weight and the weave of the duck. To utilize this advantage the common practice is to use lighter ducks in the narrower sizes of belts.

For the benefit of users the commendable practice of marking each weight of duck with a distinctive label has appeared in the trade. This method of labeling gives the engineer a means of selection. Thus he may standardize on one safe, first-class quality for all drives and at the same time standardize on the correct weight and flexibility for the service to be met by each width.




**Types of Belting: 1—Endless. 2—Rubber Covered. 3—Friction Surface.**

In any given belt the duck plies should be of the same weight and weave to produce balanced construction. For ordinary transmission service 28-, 30-, and 32-ounce ducks are used. On high speed drives with small pulleys, such as those on motors and woodworking machinery, planers, edgers, trimmers, etc., a special thin type of belt is built of hard duck of lightweight construction combining great strength and flexibility.

In all cases belts are built in duck weights and plies according to their widths for the power they are to transmit. The Mechanical Rubber Goods Manufacturers Division of The Rubber Manufacturers Association has agreed upon a schedule of belting widths and plies, which may be found in the catalogs of some of the makers of belting. This schedule is shown in tabulated form in opposite column.

STANDARD TRANSMISSION BELT SIZES AND PLIES

| Widths in Inches | Plies of Duck in Construction |
|---|---|
| 1, 1¼ | 2, 3, 4 |
| 1½, 1¾ | 2, 3, 4, 5 |
| 2, 2½, 3, 3½ | 2, 3, 4, 5, 6 |
| 4 | 2, 3, 4, 5, 6, 7 |
| 4½, 5 | 3, 4, 5, 6, 7 |
| 6, 7, 8 | 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| 9 to 24 inclusive* | 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| 26 to 36 inclusive | 5, 6, 7, 8, 9, 10, 11, 12 |
| 38 to 60 inclusive | 6, 7, 8, 9, 10, 11, 12 |

*Belt widths above 16 inches advance by 2 inches for each size.

### Rubber Composition

The purpose of rubber composition in belting is to unite the duck plies into an integral construction with capacity of strength, elasticity, and toughness sufficient to endure for a long time the exigencies of service and the effects of climatic and other deteriorating influences.

Rubber compositions in belting are applied for three distinct purposes: namely, as friction for impregnating and binding the duck plies together; as a thin layer or skim between the plies where it serves as an elastic cushion to relieve shearing strain on the anchorage of the friction in the structure of the duck when the belt makes an abrupt turn over a small pulley; and as an all-over covering to

[1] "Fabrics Used in Rubber Belting." INDIA RUBBER WORLD, Jan. 1, 1930, pp. 65-68.

protect the plied body of the belt from moisture, abrasive wear, or other injury. As friction and skim, the composition should contain a liberal volume of gum content compounded to have high tensile strength and resilience.

The cover of power transmission belting should have sufficient elastic quality to permit the inevitable stretching that a belt undergoes in the curing press. This cover, furthermore, should be made to wear well under the traction of the belt on the pulleys and to last without sun cracking for a long time in out-of-door service. All of these conditions are well met by modern compounding as compared with the practice antedating volume loading, accelerators, and antioxidants.

### Belt Construction

The operations of belt making are machine processes, from drying the duck to vulcanizing the completed belt. Hand work enters in making endless belts but not necessarily so, according to the latest practice. The processes in general are effected on calenders, and the plying up of the rubbered duck in a folding machine with calendering attachment.

The elimination of trapped air between plies is essential for their complete adherence. The presence of any considerable air between plies is virtually impossible in present practice; but should it occur, it would act practically as a wedge to force the plies asunder when the belt is in service.

### Tests

In a series of four articles on rubber belting W. L. Sturtevant[2] covered very thoroughly the subject of tests applied to the component belt materials and finished belts. He showed that the force required to separate the plies of a belt does not afford a dependable basis for comparing quality of belt friction and that the flexing test is the only acceptable method for that purpose. Virtually all manufacturers of rubber belting apply this test to their product. Jobbers of rubber belting should be informed about this test as applied to the goods they handle. The same is true of large users of belting. Construction and tests of specification belting for railway and other special applications are most exacting but unnecessary for general industrial use. The flexing test amply differentiates belting qualities for ordinary purposes.

[2] "Rubber Power Transmission Belting." India Rubber World, Oct., Nov., and Dec., 1930, and Jan., 1931.

# Hedging or Gambling

W. S. Hammesfahr

WHEN rubber consumers are told how easy it is to hedge purchases or even inventories, they often reply, "But that would be gambling."

Others say that their conservative superiors or boards of directors cannot see the advisability of hedging transactions. Let us see if it is less conservative to protect purchases of rubber with hedges, than it is to buy it in the hope that the rubber goods made therefrom can be marketed at a profit.

The purchasing agent of a rubber consumer conceives the idea that at certain price levels his company should make purchases of the commodity. If he has executive authority, he will probably go into the market and act on his judgment. If he has no authority he will discuss the idea with his superior, who may refer the matter to his board of directors. Since it is assumed that the purchasing agent is in close touch with the market, purchases are generally made because somebody thinks well of the market at certain times.

In view of the complicated methods in vogue for the marketing of articles made largely out of crude rubber, particularly tires, where frequently rebates have to be made months after the tires have been sold, such buying of crude rubber without at least securing some price insurance is hardly what could be termed conservative business. In other words, crude rubber purchases are at present made without any reasonable assurance that the value of the investment will either remain unchanged or that the company and the company's stockholders will be protected in case of a decline.

Nobody will deny that if factories had heretofore practiced hedging they would have derived large cash profits greatly in excess of any inventory write-off. But the manufacturer always has hesitated to commence with initial hedge sales, arguing that at some previous time the market ruled higher. That such reasoning defeats itself is obvious; for it could be pointed out how well it would have been if hedge sales at such higher levels had been put out. However, the question is, how can the manufacturer be benefited now. Nobody familiar with hedging will seriously advise his consumer friends to hedge his inventories at present prices, but one can suggest to start immediately at the present level to hedge any new purchases of rubber with sales for distant positions on the New York Rubber Exchange.

This means that such sales are made at premiums representing full carrying charges of the commodity from spot to the position sold. As the forward position comes nearer, it automatically loses this premium, so that if the market value of rubber improves somewhat, it will have to advance more than the premium obtained before the manufacturer, on the basis of a higher level, would have to adjust his crude rubber cost price. There will be times where hedge sales will temporarily entail cash outlays, but we are not dealing with individual transactions but with the system of hedging.

Let us assume that the market does advance. The manufacturer, owing to business exigencies—is often compelled to make purchases of rubber at any price level, so that such higher priced acquisitions are again fully protected by higher hedge sales, which invariably will produce much greater profits than the occasional outlays for hedge operations will absorb, because advances are rapid but of short duration, and declines slower and much longer strung out.

Hedging, therefore, serves one purpose definitely—to protect against undue losses. In this respect it might be argued that any losses in crude rubber from the present level, of say 7½ cents per pound, cannot be very great. Actually this is not so. Rubber was considered cheap at 48 cents a pound during the famous rubber pool; it was again considered cheap at 25 cents a pound, it was certainly considered cheap at the 15- and the 10-cent levels, yet today it is 7½ cents per pound. Any losses from this level down, in view of the present low prices for rubber articles, and the depressed business conditions, are likely to be more hurtful than reactions at much higher levels during better business conditions.

Under these circumstances, is it more conservative to hedge against contingencies that cannot possibly be foreseen, or is it more conservative to take chances on what might happen? Which is the more intelligent attitude for rubber executives, to continue to gamble or to rely on their manufacturing ability to produce profits?

Every board of directors of any factory would instruct their executives to investigate carefully and open-mindedly new processes in the manufacturing field put before them. Then why should executives or boards of directors hesitate to give the same attention to methods put before them to obviate such losses and difficulties as the price gyrations of crude rubber have brought about these last years?

# Cotton Goods Standard

## for

# Rubber and Pyroxylin Coating

THIS recommended commercial standard covers the construction, quality, sizing, methods of test, and labeling of cotton goods for rubber and pyroxylin coating.

***The Department of Commerce submits for approval of the industry, these recommended commercial standards, as sponsored by the Association of Cotton Textile Merchants of New York, The Cotton-Textile Institute, Inc., The Association of Pyroxylin Coated Fabric Manufacturers, and the Automobile Fabric Manufacturers Division of The Rubber Manufacturers Association, Inc. This recommendation is to become effective on announcement of official acceptance.***

## GENERAL REQUIREMENTS

### Quality

The goods shall be made of cotton thoroughly cleaned and carded, free from waste, of good commercial quality, evenly woven.

### Width

The width of the fabric in any roll or piece shall be determined by laying the fabric on a flat surface, under no tension, with wrinkles removed, and measuring the width perpendicular to the selvage, at five different places evenly distributed through the roll or piece. The average of these five measurements shall be considered the actual width. A tolerance of 1½ per cent plus or minus is allowable.

### Thread Count Per Inch

The count of the fabric in any roll or piece shall be determined by counting a space of not less than one inch in at least five different places in the roll or piece without duplicating the determination on any one set of threads. The average of these five or more determinations in the warp and filling shall be the count. Such count shall be as specified for the fabric in question, with a tolerance of plus or minus 2 per cent in the warp and 5 per cent in the filling from the specified count. The average of the readings in a shipment shall show a variation of not over 1 per cent in the warp and 3 per cent in the filling. No determination shall be taken nearer the selvage than 1/10 the width of the fabric.

### Unit Weight

The unit weight shall be expressed in linear yards of the fabric per pound and shall be determined from the invoiced yardage and the weight of the entire roll or piece (both verified when necessary). Such weight shall be as specified for the fabric in question, with a minus tolerance of 1 per cent on a shipment, 2½ per cent on a roll, and 5 per cent on a piece, from the specified weight.

### Tensile Strength

The average of ten determinations, five in the direction of the warp and five in the direction of the filling, shall be not less than the specified tensile strength.

In making tests for tensile strength, the 1- by 1- by 3-inch grab method according to American Society for Testing Materials specifications shall be used, as described below.

The back half of each pair of jaws shall be 2 inches or more in width, and the front half shall be 1 inch in width. The jaws shall be planed smooth and flat with edges slightly rounded to prevent cutting. The initial openings between jaws of the testing machine shall be 3 inches and the pulling jaws shall travel at a uniform rate of 12 inches per minute. Test pieces shall be 6 inches by 4 inches wide, and no two test pieces shall include the same threads.

## DETAIL REQUIREMENTS

The specified tensile strength shall be as shown below. In the case of constructions not pro rata to any of those listed below, any specified strength shall be agreed upon when the contract is taken and based on the strengths given in Table 1.

TABLE 1. TENSILE STRENGTH

| Construction Including Pro Ratas | | | Minimum Breaking Strength | |
|---|---|---|---|---|
| Inches | | Sheeting | Warp Pounds | Filling Pounds |
| 66 | 48/48 | 3.00 | 35 | 25 |
| 63 | | 3.14 | 35 | 25 |
| 60 | | 3.30 | 35 | 25 |
| 57 | | 3.47 | 35 | 25 |
| 52 | | 3.85 | 35 | 25 |
| 50 | | 4.00 | 35 | 25 |
| 49 | | 4.05 | 35 | 25 |
| 48 | | 4.17 | 35 | 25 |
| | | Drill | | |
| 59 | | 2.25 | 58 | 36 |
| 66/67 | | 1.87 | 60 | 40 |
| 65 | | 1.93 | 60 | 40 |
| 52 | | 2.38 | 60 | 40 |
| 49 | | 2.53 | 60 | 40 |
| 52 | | 2.20 | 62 | 48 |
| 59 | | 1.85 | 72 | 43 |
| 56 | | 1.93 | 72 | 43 |
| 54 | | 2.00 | 72 | 43 |
| | | Twill | | |
| 69 | | 1.37 | 80 | 59 |
| 59 | | 1.60 | 80 | 59 |
| | | Broken Twill | | |
| 54 | 85 Sley | 1.14 | 95 | 110 |
| 56 | | 1.10 | 95 | 110 |
| 54 | 76/52 | 1.14 | 100 | 100 |
| 56 | | 1.10 | 100 | 100 |
| 54 | 85/64 | .98 | 110 | 130 |
| 56 | | .95 | 110 | 130 |
| | | Sateen | | |
| 54 | 96 Sley | 1.55 | 110 | 50 |
| 54 | 96 Sley | 1.30 | 110 | 75 |
| 53 | | 1.32 | 110 | 75 |
| 54 | 96 Sley | 1.10 | 125 | 95 |
| 53 | | 1.12 | 125 | 95 |
| 54 | 96 Sley | 1.05 | 125 | 120 |

### Length of Cuts

Sheetings. Two classes of delivery in respect to length of piece may be specified in the purchase contract: (1). Double cuts as far as practicable. (2). Long cuts.

Double Cuts. In classification known as "Double cuts as far as practicable" 10 per cent of pieces in from 40- to 80-yard lengths will be accepted at the contract price, the balance to be in pieces and not less than 80 yards in length.

Long Cuts. The designation of long cuts of sheetings shall require an average length of piece of 250 yards with a minimum of 200 yards, supplier having the privilege of applying up to 10 per cent, if made, of pieces from 100 to 200 yards in length at the contract price.

(1). Drills. The designation of long cuts of drills shall require an average length of piece of 175 yards with a minimum of 120 yards, supplier having the privilege of applying up to 10 per cent, if made, of pieces from 60 to 120 yards in length at the contract price.

(2). Sateens, Broken Twills, and Moleskins. The designation of long cuts of sateens, broken twills, and moleskins shall require a minimum length of 120 yards, supplier having the privilege of applying not more than one 60-yard piece for 500 yards shipped at the contract price.

### Defects

Cotton goods purchased under these specifications will be used in the manufacture of coated fabrics and the vendor, in the manufacture and inspection of these goods, shall endeavor to meet the requirements of this industry. All fabrics shall be inspected and burled on both sides. Certain defects shall be classed as major defects and shall not occur in a roll on an average of more than one defect to every fifteen yards. A minimum allowance of ¼-yard will be made for each major defect. There follows a list of those defects, which are classified as major at the present time: smash, washed out oil spots, starchy places, group float, heavy filling, shuttle mark, heavy warp, kinky filling, two contiguous filling threads missing.

These defects are probably not all which should be listed so that this list is subject to change by common agreement. Also one major defect on the average of every fifteen yards does not represent the quality desired but has been suggested as a fair basis both to mill and to consumer. The aim of the mills will be so to improve the quality of their goods that this average yardage between defects may be increased.

The following named defects shall not be present in goods offered to this industry: oil spots, holes, torn selvage, warp streaks.

### Selvage

Selvages of these fabrics shall be of uniform width and of equal width on both edges of the fabric. Selvages shall be so made that the tension shall be the same as and shall lie flat with the body of the cloth. Baggy goods and curling selvages are cause for rejection.

### Sizing

It shall be recognized as a rule that as little sizing shall be used in the fabric as is necessary for its proper manufacture. Assuming an average content of natural oils and waxes indigent to the cotton of 3.2 per cent, the total percentage of sizing and natural oils and waxes shall be no more than is shown in the following table for each type of fabric.

| | Per Cent |
|---|---|
| Sheetings | 8½ |
| Drills | 11 |
| Sateens | 10¼ |
| Broken twills | 8.15 |

### Injurious Chemicals

It shall be recognized that there are certain chemicals, listed below, which are injurious to rubber, and insofar as these come under the control of the mill the quantity shall be no more than the percentage shown:

| | Per Cent |
|---|---|
| Copper | .001 |
| Manganese | .0005 |
| Grease | 1.00 |

## METHODS OF INSPECTION AND TEST

### Test Conditions

Tests shall be made at prevailing atmospheric conditions, except in the settlement of disputes regarding strength. In such cases, tests shall be made on material which first has been brought to standard moisture condition, obtained by exposure for four hours to an atmosphere having a relative humidity of 65 per cent at 70° F.

"In the acceptance or rejection of each shipment, tests shall be made on samples taken from 20 per cent of the rolls in each shipment; except that in shipments of 1 to 3 rolls, each roll shall be tested; in shipments of 4 to 9 rolls, three shall be tested; in shipments of 10 to 19 rolls, 4 rolls shall be tested. Five samples shall be taken from each roll for warp and for filling. The average of these shall be considered as the tensile strength of that shipment. This average shall be no less than the specified tensile strength. The seller shall have an opportunity of checking the accuracy of the tests and, if agreement cannot be reached, tests shall be made by a disinterested party whose decision shall be final."

### Sizing

Tests to determine the amount of sizing shall be made according to the following method:

(1). Cut one square foot of fabric and dry to a constant weight in a ventilated drying oven maintained at a temperature of 220° to 230° F. Samples shall be weighed from time to time; when two such weighings, not less than 10 minutes apart, do not show a loss more than .1 per cent of the previous weight, the material is considered to be bone dry. These weights can be obtained in a conditioning or drying oven with a weighing device mounted on top in such a way that samples may be weighed while they are in the oven; or, if no such weighing device is available, the samples may be taken from the oven and very quickly inserted in a glass capsule or bottle with an air-tight glass stopper. The bottle, with the samples, may then be weighed and the tare weight of the bottle subtracted.

(2). Boil for 30 minutes in a ½ of 1 per cent hydrochloric acid solution; such solution is to be boiling before the samples are placed in it.

(3). Remove samples and rinse thoroughly in clear water.

(4). Boil the samples for 30 minutes in a 1 per cent solution of sodium carbonate; the solution is to be boiling before the samples are placed in it.

(5). Remove samples and rinse thoroughly in clear water.

(6). Obtain bone dry weight as described in (1).

(7). Calculate the percentage loss in weight between (1) and (6) and subtract 3.2 per cent as an allowance for the extracted weight of oil, waxes, and other foreign matters; the difference arrived at is considered to be the percentage of size. (In arriving at the average of 3.2 per cent above, many tests were made in the following manner: by cutting one yard of yarn from beam before it entered slasher and then cutting a one-yard sample of the sized yarn and also a one-yard sample of cloth from the loom, and boiling them in same process; the actual average is 3.2 per cent, the low being 2.63 per cent and the high 3.85 per cent.)

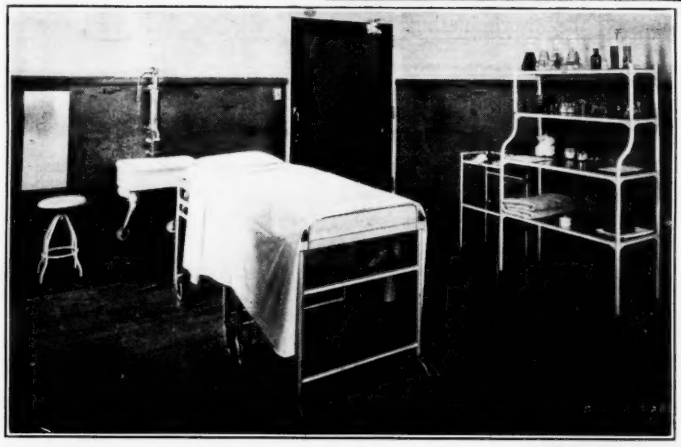
# After Ten Years—*What?*

## A Brief Review of Rubber Flooring

**James H. Stedman**[1]

RUBBER flooring as an integral part of building constructions may be said to date from the introduction of interlocking tile some thirty odd years ago. A rather notable example of this early use was in the then-new Hotel Essex in Boston. The event was celebrated by the New England Rubber Club with a dinner there. Interlocking tile found favor in a fair degree on ferry boats, in railroad stations, and in public buildings. This flooring had little color value,

*Associated Screen News, Ltd.*
**Crane Co. Showroom, Montreal**



*S. J. Hayward*
**Operating Room, Royal Victoria Maternity Hospital, Montreal**

depending on geometric designs for patterns, and on account of its high mineral contents was hardly to be considered as a resilient floor. It did, however, give excellent service often under trying conditions.

Little progress was made in the use of rubber for floor construction until ten years ago at which time the first striated multiple colored rubber flooring was commercially produced. The beginning of the industry was an accident. For some years prior to 1920 the writer had been experimenting with rubber and cotton to make a practical flooring which could be nailed to an under wooden floor in the same manner that hard wood floors are laid. Molds were procured; then sufficient flooring to lay several small areas was made in tongue and grooved oblongs 12 by 24 inches. All of these were done in black. In an effort to produce white from the molds in which the black had been run, a sample was made which showed cloudy black spots on the white.

The comment on this first sample by the architects to whom it was shown was, "Well, you have made marble."

This germ of an idea grew overnight, and within a week numerous color combinations were presented for the architects' consideration. The material made an appeal almost at once; and before it was possible to find proper equipment for cutting or sanding for thickness, orders were to be filled.

The first installations of size were at the Seaboard Bank, Hotel Astor, and Fifth Avenue Hospital, in New York, and the Boston Lying-In Hospital. Definite impetus came in the Fall of 1922 when the American Hospital Association in the report of the Committee on Floors definitely commended reenforced rubber flooring as first choice in most hospital areas. The field rapidly widened and the universal use of rubber flooring

*Associated Screen News, Ltd.*
**Ste. Brigide Church, Montreal**

[1]Founder and for many years until 1929, president of Stedman Products Co.

was exemplified by such clients as General Motors, Marshall Field & Co., United Fruit Co., Illinois Merchants Bank, Royal Victoria Hospital in Montreal, and many other users.

The general acceptability of the product today has reached the stage where it might almost be called an acreage business; for the Harkness dormitories at Harvard have about six acres of rubber floor already installed. Ford has some 2½ acres in one building and now after three years is about to install some 350,000 feet (about 8 acres) in his museum. Contract has recently been let for rubber flooring for the United States House of Representatives, some 375,000 feet; Aetna Life Insurance, Hartford, Connecticut, about 3 acres; Illinois Merchants Bank of Chicago over a period of years has been installing rubber flooring to the aggregate of more than 3 acres; and we might add, the Fisher Building in Detroit with 7 acres; and so on. Based on the Rubber Manufacturers Association records a conservative estimate of rubber floor installed in the United States and Canada during these ten years would be placed at 50,000,000 square feet.

It would seem as though such progress was based on universal satisfaction, that rubber flooring was an economic certainty. From what we know as to its probable life, it may be safe to judge the future in the light of past performance. It is with such thought in mind that some of the earliest users were consulted and it is on the testimony of two of them that the deponent is inclined to rest his case, believing that their experience might well express the composite thought of all.

Fifth Avenue Hospital in 1922 installed some 40,000 square feet. Its director then and now, Dr. Wiley E. Woodbury, states that if he had the choice of flooring to make over again, he would use rubber floors not only in his corridors but in the rooms where terrazzo was used.

Frank E. Chapman was chairman of the American Hospital Association Committee on Floors in 1922, in which year the American Hospital Association in its report on Floors (Bulletin 47) endorsed reenforced rubber as its first choice in whatever areas a soft type floor was indicated. Mr. Chapman today, as director of Administration of the University Hospitals of Cleveland and chairman of American Hospital Association Committee on Rubber Tiles, says:

"The experience of the years since 1922, when the original flooring report of the American Hospital Association was circulated, confirms the opinion that rubber flooring, provided it is properly laid and located in proper facilities, is the best flooring of the so-called soft type of flooring."

That rubber flooring will long continue to be a valuable adjunct to our modern construction is based on two factors: first, proper construction, and second, proper laying, both equally important. For if the formula is not properly balanced or the vulcanization over or under what it should be, the resultant flooring may be either too hard or too soft. If, moreover, the laying is poorly done and the floor creeps or buckles as a result, discredit comes where permanent satisfaction should be had.

In conclusion the writer would urge all manufacturers of rubber flooring to watch most carefully their finished product and refrain from selling flooring that is not up to the standard which will continue to merit the confidence of the discriminating.

# Rubber Colors[1]

THIS paper contains many points of practical interest for the rubber compounder. The authors state that the rubber industry, probably more than any other, is exacting as to color quality and performance of pigments. It is a distinct advantage to have a color suitable for use in any type of mixing and type of cure.

Before the extensive use of organic accelerators the long steam cure often employed was fatal to many organic colors, and, indeed, to some mineral colors. Low-temperature curing, however, has widened the field of bright organic colors available, although blues and greens seem very sensitive to the action of wet steam. Early attempts to obtain brightly colored ebonites failed, but attractive ebonites can now be produced.

Colors for rubber should be stable to dilute acid or alkali. In cold-cured rubber, of course, this quality is essential both for curing and subsequent processing. Colors unstable to alkali are unsuitable for sponge manufacture and cause trouble if used in rubber flooring because of the caustic cleaning materials. Stability to perspiration is another factor of importance in connection with colors for proofing. Golden antimony sulphide is particularly susceptible to acidity or alkalinity, and without considerable cure it readily bleaches or blackens.

Some colors retard accelerators, others are mild accelerators, and still others activate accelerators. Using a standard accelerated base, it frequently happens that variation in physical conditions and the rate of cure occurs if different colors are employed. Ultramarine often retards, iron oxide accelerates, and golden antimony may induce scorching.

Light fastness is important to the rubber manufacturer. Some mineral colors appear to exhibit slight color changes. Cadmium sulphide recovers a certain amount of brilliance possibly lost during cure, and ultramarine frequently darkens in sunlight. Organic colors, unless carefully chosen, invariably darken, violets, greens, and blues possibly more than other colors.

As to the method of testing light fastness, natural daylight exposure is preferable to any artificial test. It is certain that an artificial light aging test does not inevitably agree with a natural light test.

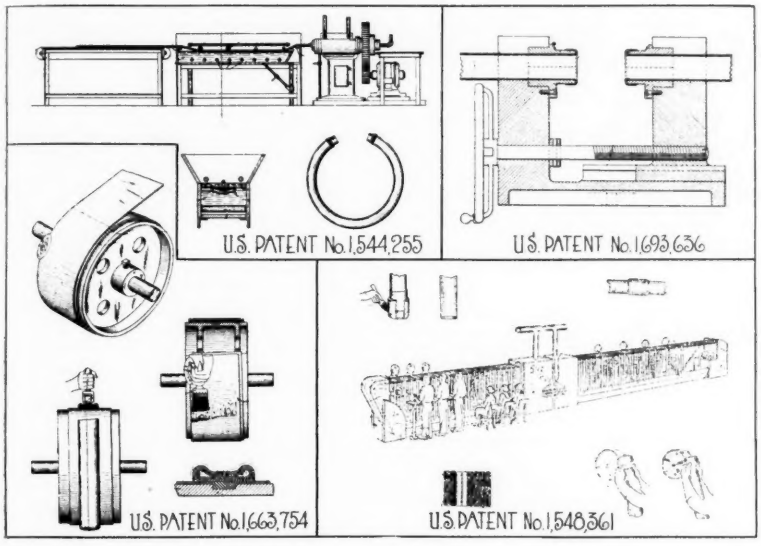
Probably the impurity most feared in rubber is copper, the occurrence of which in proofings is perhaps more often due to the fabric rather than the color employed, although poorer grades of ingredients such as blacks, zinc oxide, and litharge have been known to contain copper. Of recent years the demand for ornamental rubber has resulted in the appearance of bronze powders as proposed colors for rubber. Other harmful impurities which should be avoided are manganese, soluble iron, and chromium salts.

Migration of color, whether to the surface as a bloom, or to adjacent rubber during or after cure, is another source of trouble. This can be readily tested by curing a small disk of the colored rubber on to a sheet of the uncolored base. Any migration of color to the white base can be readily observed, and subsequent blooming to the surface detected after a few days. The blooming of such rubber-soluble colors can often be prevented by the addition of fatty acid, but if colors of this type must be used it is advisable to employ a minimum of color. In other words the concentration of the color should not exceed its solubility in rubber.

In the past the lack of fineness in colors caused considerable trouble to rubber manufacturers. Uneven dispersion, impurity of tone, pimpling, etc., are readily caused through colors being gritty. As with reenforcing ingredients, fineness of particle size is a desirable feature, but there is a limit dependent on the individual pigment. The apparent color of a pigment becomes paler with reduction in particle size, but the covering power is considerably increased.

[1] "Colors Used in the Rubber Industry." By G. F. Thompson and E. V. Bratby. Paper presented at a joint meeting, Feb. 27, 1931, of the Manchester Section of the Oil and Color Chemists' Association and of the Manchester and District Section of the Institution of the Rubber Industry.

# Making Inner Tubes[1]




## Extruding Tubes

HEAVY tubes made in the usual way by tubing give great trouble because of porosity. If the tube is quickly cooled upon its formation, no porosity will result in the vulcanized tube. Actual tests have shown that quick cooling decreased the number of porous tubes from over 50 per cent, in the case of otherwise identical tubes made without cooling, to zero in the case of the cooled tubes. The explanation for this depends upon the inhibition of the formation of large sulphur crystals which otherwise melt out, causing porosity, during subsequent vulcanization. The formation of large crystals is prevented by cooling the extruded mass before the sulphur has a chance to migrate. Any crystallization which takes place under these circumstances will be restricted to the usual "bloom," in which the sulphur is of a dustlike fineness insufficient to cause porosity; instead of developing to the extent which the retained heat of the heavy rubber mass would otherwise permit.

The process is of particular utility in cases where the tubes are to be vulcanized in open steam without external confining means, for the steam will fuse out the sulphur and penetrate the voids thus formed without exerting any tendency as a confining wrapping or mold would to close up the holes.

According to United States Patent No. 1,544,255, June 30, 1925, to Maynard (see group illustration), a tubing machine extrudes a rubber tube continuously as long as the machine is supplied with rubber. The tuber is fitted with heating and cooling means to provide for smooth extrusion of the rubber and soapstone is introduced into the formed tube to prevent its walls from adhering. The tube is cooled as soon as convenient after its formation. Ordinary room temperature is sufficiently low if it is cooled promptly. The cooling device has top and bottom rollers, which support the tube loosely during its passage, and cold water is sprayed through pipes against the top of the flattened tube, the bottom of which rests upon a body of water. Guide rolls direct the tube to a receiving conveyer upon which the tube is cut to the desired length.

The cooled material may now be stored in piles without danger of the retained heat causing large crystals, and may be formed into a tube cut to length, and mounted on a curved mandrel. By taping the ends of this tube to the mandrel it can be vulcanized in a heater in open steam without danger of porosity.

## Building Tubes on a Drum

A later United States patent, No. 1,663,754, March 27, 1928, to Gammeter, describes making a tube by helically winding a sheet of rubber on a drum and joining the margins together.

Referring to the group illustration, the apparatus comprises a drum adapted to be mounted for rotation and having upon its outer face an annular band of flexible, elastic, non-adhesive material such as vulcanized rubber; this band is preferably formed with a middle rib on its inner face, set into a groove on the surface of the drum to maintain the band properly centered upon the drum. A strip of calendered stock is wound upon the drum and over the band. The winding is given such helical form that the margins of each turn of the material are slightly offset from those of the preceding turn.

When the desired number of plies have thus been drawn onto the drum, the strip is severed, and the residue of the stock strip is freed from the drum assembly.

A valve stem patch is then mounted upon the margin of the winding at which the last wound ply overhangs the underlying plies, and the valve stem hole is punched in the patch and through the underlying tube stock. The exposed outer surface of the winding, except the margin opposite that to which the valve stem pad is attached, is treated with a wash consisting of a highly volatile liquid containing a suitable substance in solution or suspension to prevent adhesion of the rubber when the solvent evaporates.

After the solvent has evaporated, the margin upon which the valve stem patch is mounted is progressively turned over to approximately the middle line of the assembly, together with the adjacent margin of the non-adhesive underlying band which may be readily accomplished by rotating the drum and manipulating the margins with a suitable turning tool.

The opposite margins of the band and of the work are then similarly turned over, and the margins of the winding of the tacky rubber strip are progressively joined together in mismatched relation. The portion of the valve stem patch which projects from the margin is stuck to the inner face of the inner ply of the margin so that it lies within the resulting tube, bridging the seam. The seam is then compacted by rotating the drum with the work thereon while holding a roller against the middle portion of the work.

The tube is then removed from the drum, turned so that the seam and valve stem patch are on its inner periphery, and is vulcanized under internal fluid pressure to prevent contact and adhesion of its inner surfaces. A valve stem is inserted prior to the vulcanization.

[1] Continued from INDIA RUBBER WORLD, March 1, 1931, pp. 68-69.

The method results in a longitudinally seamed tube of which the seams of the several plies are mismatched, and has the same number of plies at all parts of the tube.

### Full Molded Process

It is now becoming common to cure tubes in individual steam heated molds so that the tube is cured in endless and curved form. The molds are kept hot continually, whether tubes are laid in them or not, so that when the tube is placed in the mold, it is immediately subjected to heat. The so-called watchcase vulcanizers are particularly well adapted for this process of curing tubes. It is customary to apply fluid pressure internally of the tube using either steam or carbon dioxide. The tube is thus subjected to internal as well as external pressure.

One of the early methods for molding tubes is described in United States Patent No. 1,388,138, Aug. 16, 1921, to Atcheson. Each tube is placed in an individual mold. Cold air or low pressure steam is first admitted into the tube in order to expand and cool it and to prevent it from becoming too soft until the outer surface is partially cured. High pressure steam is then admitted into the tube until it is completely cured.

### Tube Splicing

Inner tubes are customarily built and vulcanized upon a mandrel, either straight or curved, from which they are stripped after vulcanization. The stripped tubes, usually inverted so as to bring the smooth surface outside, are now ready for splicing, which is accomplished by cementing the ends of the tube, slipping one end over the other, and curing the tube either by heat or by the cold or "acid" process. In practicing this process a large percentage of defective splices results, and particularly in humid weather. These defects are primarily due to the blooming of the rubber and to the collection of moisture on the surface of the rubber and on the cement.

With the methods formerly in use it was impossible to control this formation of bloom because varying times elapsed between the buffing and the cementing operations. The last tube to be buffed would be among the first to be cemented. This tube would probably show a satisfactory splice; whereas the first tube to be buffed would be among the last of the pile to be taken for cementing, and would probably show a defective splice. A similar difficulty has also arisen because of overexposure to the air of the tube between the cementing and splicing operations. Controlled time conditions are also desirable here so that all cemented tubes will be spliced under uniform circumstances.

According to United States Patent No. 1,548,361, August 4, 1925, to Grennor, in order to insure equal treatment for all tubes in respect to time elapsed between successive operations, the tubes are carried upon a moving conveyer which supports the central portion of the tubes and permits the side portions to hang free. The conveyer is supported by pulleys and is driven at a slow but steady rate of speed by a motor. The lower run of the conveyer passes through a housing to protect it from the dropping of cement or buffed-off particles. Intermediate of its length the top run of the conveyor passes through a chamber, heated as by steam, and provided with suitable ventilating devices.

The tubes are placed on the conveyer at the end to the left in a state ready for buffing. (See group illustration.) They are, therefore, preferably trimmed to length and skived or beveled, although the exact treatment prior to this point is not material. By the steady travel of the conveyer these tubes are brought to operators, each of whom is provided with a power driven buffing wheel. One end of the tube is cuffed or bent back on itself so that the buffing and cementing will be done on what is to be the inside of the tube, while the other end is left straight. The operators on one side of the conveyer operate on one end of the tubes while those opposite work on the other end.

A suitable speed for the conveyer is about six feet a minute. If the tubes are spaced about six inches apart, they will pass along faster than one man could thoroughly buff them. The movement of the conveyer takes the tubes individually and successively from the buffing operators to operators similarly arranged on opposite sides of the conveyer, who cement the ends of the tubes.

From the cementing operators the tubes are carried individually and successively through the drying chamber, and on emerging from the far end the tubes are ready for splicing. Stationed adjacent the conveyer at this point are splicing operators who take from the conveyer the tubes and form the splice in any suitable manner.

### Splicing and Cutting the Tube

In making inner tubes the ordinary methods of splicing, which consist in overlapping the ends of the tubes, are unsatisfactory in that the overlapped section is of a greater thickness than the rest of the tube. Accordingly a short splice, which would greatly reduce the area of uneven thickness and also save material, is very much desirable.

According to United States Patent No. 1,693,636, December 4, 1928, to Coe, unvulcanized rubber is rolled or extruded into tubular form of a length slightly in excess of that necessary to manufacture a complete tube. The opposite ends of the tube are then completely encircled with opposing endless members or mandrels, which are each provided with a section removably secured in place in any suitable manner. The ends of the tube protruding through the two members are turned back outwardly to form cuffs; the members are then moved toward each other until the cutting edges of the mandrels meet, welding or uniting the opposing surfaces of the stock at the same time that the excess material is sheared off. The sections of the members are then removed or swung to one side, and the tube thus completed in annular form is taken out and vulcanized. (See group illustration.)

### Abstracts

The following abstracts give a survey of the numerous methods which have been proposed and patented for making inner tubes.

1. Rathbun, 509,097. Nov. 21, 1893. The process consists in attaching a diaphragm to the tube, leaving its ends disconnected, telescoping the tube ends so that the inner tube end enters the slits of the outer tube end, and then closing the joint.

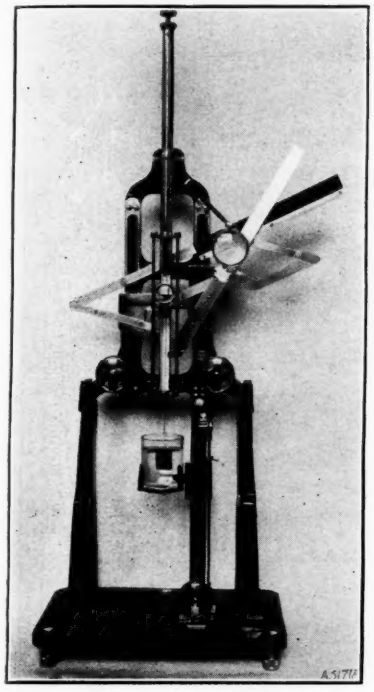
2. Morgan, 544,626. Aug. 13, 1895. The process consists in forming unvulcanized rubber into a thin film; placing upon a cushion table a sheet of the film of sufficient size to form the entire multiply tube which is to be produced; forming the sheet into a multiply tube having its plies in direct contact one with another without air spaces between them, by rolling the film, while lying on the table, upon a mandrel and upon itself, and during such operation subjecting the film and plies of film to compression between the table and the mandrel; and vulcanizing the multiply tube thus formed so as to unite the plies of film and adapt the tube for service in a pneumatic tire.

3. Morgan, 544,627. Aug. 13, 1895. The process consists in forming unvulcanized rubber stock into sheets of thin film; spreading a plurality of such sheets preparatory to rolling them into tubular form; successively rolling up a plurality of such sheets directly upon one another to form a multiply tube composed of plies of unvulcanized rubber film in direct contact with one another, and during such operation subjecting the plies of film to compression; and vulcanizing the multiply tube thus formed.

(*To be continued*)

# Direct Reading Gravitometer

## A Useful Instrument *for the* Rubber Compounder



Avery Gravitometer for Solids

A DIRECT reading gravitometer is indispensable for checking the specific gravities of mixed stocks as produced in a rubber factory mill room. Such an instrument must show accurate results that can be easily and quickly read.

The ordinary method of ascertaining the specific gravity of a solid substance is by obtaining on a fine balance the weight of the specimen in air and its weight in water and subtracting the latter weight from the former, thus obtaining the weight of the water displaced. If this weight be divided into the weight in air the specific gravity is obtained. This method is slow and involves arithmetical work. The modern method is quick and accurate, and all calculations are done mechanically.

An instrument, here pictured, of English design and manufacture is admirably adapted for ascertaining quickly and accurately specific gravities or comparative densities of solids. This feature is of great importance in the rubber industry because a check can be made without interference with production since a test on this instrument requires only 30 seconds.

It should be noted that this gravitometer for solids is limited in scope to light metals and other light substances and is not adapted for heavy metals or absorbent materials. The capacity of the standard instrument for solids covers specimens varying from 2 grams to about 250 grams. A range of springs would be required to cover the full weight capacity of the instrument, but the standard spring with its full useful range of from 4 to 10 grams is sufficient for ordinary requirements. Readings can be made very easily for the standard scale has subdivisions spaced 1/32-inch corresponding to specific gravity of 0.005. The powerful magnifying lenses provided with these gravitometers facilitate subdividing the scale graduations.

The action of the gravitometer is based on the principle of similar triangles, as shown in the diagram to which reference is made in connection with the following description of the operation of the instrument.

[1]W. & T. Avery, Ltd., Birmingham, England.

To ascertain the specific gravity of a solid specimen the zero reading of the instrument is first adjusted by means of a screw at the top of a vertical tube containing a spring. The specimen to be examined is then hung on a hook suspended from the bottom of the spring. By turning a milled knob on the right a pointer attached to an inclined graduated bar at its zero is brought into coincidence with a pointer attached to the spring; this position is relative to the weight of the specimen in air.

A beaker containing water, fitted in a holder, is raised by turning a milled knob at the base of the instrument, until the specimen is immersed. A third milled knob on the left of the instrument is now turned, and a knife-edge on which the lower member of the parallel rule is adapted to slide is moved to coincide with the weight-in-water indication of the spring resistant.

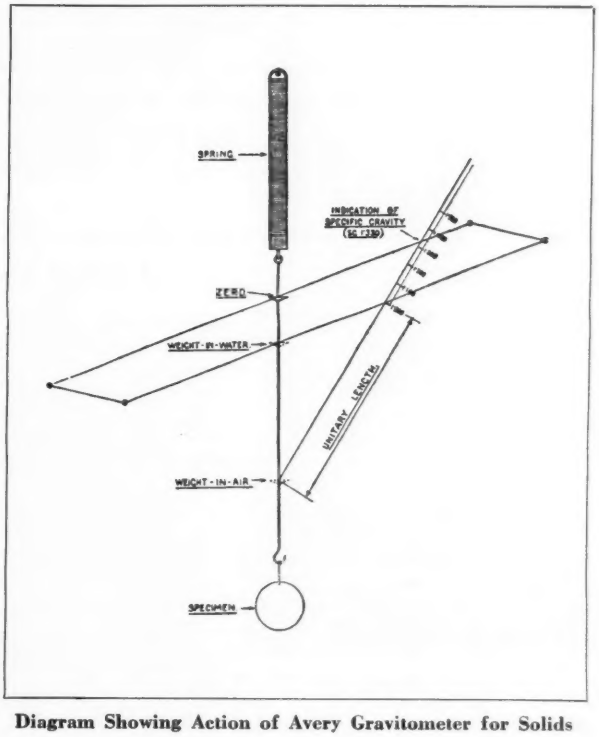
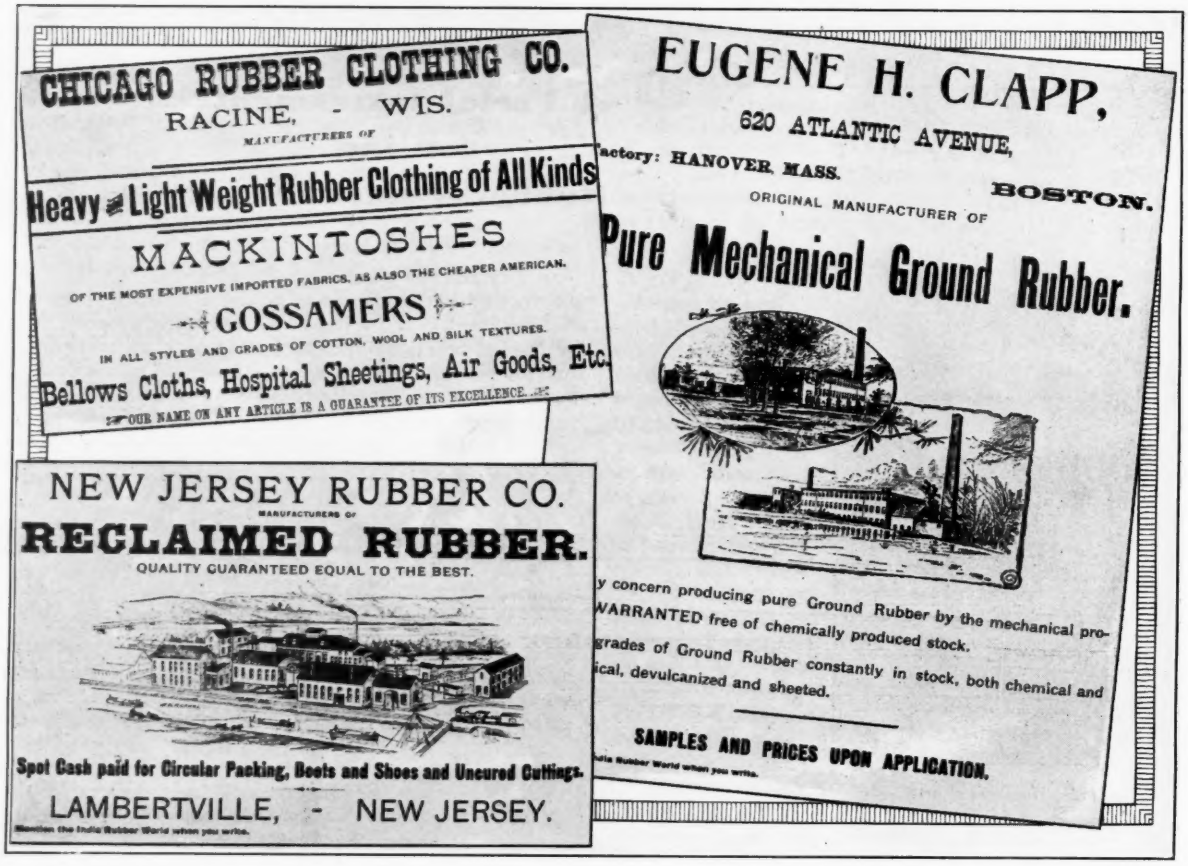



Diagram Showing Action of Avery Gravitometer for Solids

This lower member of the rule is pivoted to the inclined graduated bar in such a manner that it always passes through the unitary indication marked thereon.

The specific gravity of the specimen can then be read directly on the graduated bar at its intersection by the upper member of the parallel rule.

# Consistent Advertisers




## *The Above Advertisements Were Published in Our Journal Forty Years Ago*

—The rubber business of the late E. H. Clapp will hereafter be carried on by a corporation, styled The E. H. Clapp Rubber Co. A charter has already been applied for. The business will be continued practically the same as formerly, as the corporation is to be a close one, the heirs of Mr. Clapp, comprising three children, a widow and two brothers, being the only interested ones. The management of the new company will be in the hands of the late Mr. Clapp's two brothers; George A. Clapp and Arthur W. Clapp will be president and treasurer respectively of the new company. Both brothers of Mr. Clapp have been concerned in the management of the business from its beginning.

—The reclaimed rubber factory of The E. H. Clapp Rubber Co. (Boston), at Hanover, Mass., is reported to be running on full time, with a full complement of employes. The last annual report of the corporation, filed with the state authorities, shows: *Assets.*—Real estate, $29,804.70; machinery, $36,600.62; cash, bills receivable, and merchandise, $145,077.27; total $211,482.49. *Liabilities.*—Capital, $200,000; debts, $1,457.45; total, $201,457.45.

—The New Jersey Rubber Company have been incorporated recently, under the laws of the state named, with $25,000 capital. The place of business is to be Lambertville, N. J., and at first the Company will reclaim rubber only. They expect to begin operations about August 1st. The Company are in possession of the plant known heretofore as the Lambertville Iron Works, composed of five main buildings, respectively in size 150 x 74, 130 x 45, 80 x 45, 40 x 30, and double office 40 x 30 feet in size. The buildings are alongside the Belvidere Division of the Pennsylvania Railroad. The present capacity of the works is 7,000 pounds of reclaimed rubber per day of ten hours, there being water power equivalent to 150 to 200 h.p.

—The Chicago Rubber Clothing Co. have been straining every nerve since last February to make up a stock of goods for the fall business, and although they are shipping goods very freely, their place is still full of goods awaiting the regular season for shipments. They are, however, still behind with their orders at least two months, which would indicate that a good year's business is in prospect for the Chicago company.

—The *Chicago Inter-Ocean* thus speaks of the Chicago Rubber Clothing Co.: This company is engaged in the making of ladies' gossamers, cloaks, mackintoshes and rubber clothing. It was originally incorporated in Illinois, and operations were carried on in Chicago and Grand Crossing, Ill. In 1886 the company was organized in Wisconsin, and the works were erected on its ground covering four acres in Racine. The main building is 200 x 40 feet and of brick. The motive power is furnished by one Atlas automatic engine of 150 horse-power. There are six mills and a calender weighing 65,000 pounds in the machinery room, while the company employs, altogether, over 200 people.

# Rubber Dominates Bathroom

## For Shower Curtains, Window Drapes, and Other Accessories

THE modest violet of the modern home has blossomed forth in a glory rivaling the lilies of the field. Color predominates in the bathroom. So does rubber. Consider, for example, rubber toothbrushes, massagers, soap dishes, floor and tub mats, shower curtains, and now even window drapes and toilet seat covers.

The last three in supplying the keynote of the room's color scheme nicely harmonize. Indeed the same material is used throughout in a variety of colors and subjects, the latter, of course, chiefly aquatic. The water lily, the lotus, and even the iris grace delicate backgrounds. More striking designs, mostly airbrush, are gulls on the wing, frog and fish lazily swimming, colorful sailing vessels suggesting the Spanish Main, and even picturesque lighthouse scenes. No matter what you plan your bathroom, a sea green haven for mermaids, a pond of huge water lilies, a blue sky for flying birds, even a bounding main for vivid young pirates, you are sure to find a design to complete the illusion.

Nor are the colors lacking. Pastel shades are the rage, with orchid, green, rose, peach, maize, blue, and even white vying for popular favor. If the bathroom is sunny, however, care should be taken in insuring sunfast colors.

The materials generally used for curtains include all cotton, all rayon and rayon mixtures, all Celanese and Celanese mixtures, and all silk and silk mixtures. Modern ingenuity by specially treating the materials makes possible the use of fabrics hitherto undreamed of for such purposes.

Shower curtains are made in single, double, and triple widths. For overhead rings a double width is used. The corner-style shower takes a triple-width curtain or one single and one double. The recess type, however, is concealed behind a double width curtain, which may be draped to one side, or behind two single widths draped one on each side. For the stall or cabinet model, though, a single-width curtain will suffice. Pier or U-shaped showers utilize two double widths.

The curtains usually are six feet long as the regulation size is 70 by 72 inches. They boast cemented vulcanized seams. Many curtains, moreover, have side fasteners.

Arch enemy of the shower curtain is mildew. But here rubber comes to the rescue. Properly applied, a rubber coating on the fabric will prevent it from absorbing water, and the little water that would strike the cloth through splashing from the bottom will dry so quickly that germs will have no time to colonize.

Shower curtains and window drapes require special attention if they are to give satisfactory service. As much as possible keep the strong sunlight from them. If the rubber coating is wet, do not drape the curtain back but rather spread it out wide and let it dry thoroughly before tying it back.

A smart finishing touch to the curtain for shower as well as window is the rubber tie-backs. These accessories, taking the form frequently of flowers, come in solid or contrasting tones to suit any color scheme.

To carry out the ensemble effect in the bathroom, window draperies are offered in material matching the shower curtains, though not always rubberized. Indeed the question of rubber coating window drapes should engage the attention of the chemist, for to date rubberized drapes have not always been found practical. Some, nevertheless, are rubberized. The result well merits the interest of any interior decorator, professional or housewife.

One attractive window curtain set has a rod pocket on side drapes and valance. All edges are scalloped. The side draperies are 54 inches long, finished, and the valance 9 inches wide by 36 inches long, finished. Tie-backs complete the picture.

**Seat Cover**

Other interesting numbers, with or without valances, have plain hems or hemmed ruffles. These drapes are 63 inches long, unfinished at the top so that the housewife may cut off to the desired length and make a pocket for the rod. Many special orders thus are eliminated. The valance is 9 inches wide by 48 long, a size that will fit most bathroom windows.

Tie-backs, 2 by 16 inches have attached loops for fastening.

Some sets of draperies include two panels 45 inches long and a valance 45 inches wide. Besides sets with either scalloped or ruffled edges the combination of ruffled panels with scalloped valance is pleasing.

**Window Drapes**

**Shower Curtain**

Toilet seat covers also are made of materials to match the shower curtains. These covers, smart and useful, are laced to fit any seat.

Illustrations through courtesy of Para Mfg. Co., Newark, N. J.

# What the Well-Dressed Swimmer Will Wear—

## *Paris-Inspired Fashions for 1931*[1]

SHOULD not the woman be so smart when she goes swimming as when she is enjoying her other sports, such as golf, tennis, boating? She should; and she shall!

Bathing fashions are really stunning. The bathing ensemble, as a matter of fact, is the fascinating Paris mode adapted to the needs of the woman on the beach. She who swims in the sea or suns herself on the sands, therefore, is truly *de bon ton.*

The new millinery modes for bathing look for all the world like the chic creations in the Fifth Avenue shop windows for you'll find the important Paris fashions for women's sports and street hats in these striking new water hats for 1931.

The fashion is to wear a shallow little hat far back on the head, showing the hairline. The fashion is to wear the hat that turns back off the face—the beret, the turban. These styles, in consequence, are here in the new bathing hats.

Bows at the hairline, smooth little feathers, modern-mannered decoration, all are simply and strikingly done. Black with turquoise, pink, green, white, all white, the smart summer accessory color, bright red, the new sunray yellow, full deep blue and brilliant greens, liquid lilacs, spirited Algerian hues, monotones, ombres, plaids—any color or combinations of colors may be had for the asking.

Women will adore these new bathing caps for they do not sacrifice a whit of usefulness to smartness. Both qualities are present.

The new air-cured caps are a delight when on the head. Molded on a form when they are being made, they fit in a glove-like manner. They seem to be made especially for the persons who wear them. A wide variety of designs—seaplanes, seaspray, sunbursts, and the like, make these hats even more attractive.

A new translucent gum cap will give the woman eye satisfaction as well as wear. The colors are so cool, clear, bright. She picks up the cap, and its translucency interests her. She finds all the lovely pastels in smooth-toned blends. The caps, furthermore, fit snugly with no undue tightness—just comfort.

The new helmet has a flair for fashion. The new center section is shaped to make a perfect fitting cap . . . and the section goes in for color contrast very often. The effect is stunning.

The Normandy caps, modeled after the bride's cap in faraway France, do lovely things to women. They were designed to be practical, comfortable, charming . . . and they are!

[1] Sketches courtesy of B. F. Goodrich Rubber Co. and Miller Rubber Co. both of Akron, O.


The decidedly practical swimmer who wants the sturdy helmet finds it, sometimes showing the forehead in an up-to-date triangle. If she wants to be sure that nary a drop will reach her ears or hair, she will wear the helmet that hugs the head tightly and is spaced for the ear.

Nor are the men neglected in this season's array of beach-wear. Shower caps and diving helmets, plain but sturdy, that afford protection in ocean, pool, or shower, caught the attention of buyers in the pre-season showing.

### Beach Footwear

The 1931 bathing shoes, of course, have taken to heels . . . high ones and low ones, not excluding the even soled style, which continues to be popular. Sandals strike a responsive fashion note, and you'll see them constantly at every resort.

The new season's colors appear too in shoes . . . all white, yellow, yellow with white, besides many high colors.

Sandals with molded sponge rubber soles, toe strap, and counter, built especially for men's use on the beach and in the locker room have grown in popularity. This season's styles offer unusual values.

### The Illustrations

The following descriptions will give some inkling of the sketched accessories. A. The shaped helmet is everything that the expert swimmer could want in a cap. It is fashioned to follow perfectly the contour of the head. A center section of rubber also is molded along the lines of the head. This shaped

section is *le dernier cri* in modish marine millinery. This middle piece contrasts in color with the rest of the cap.

B. A practical swimming cap is this number, and as smart as the moment for bathers. The cap itself is snug, smooth, fetching. A draped band that snaps securely around the head is as swanky as the most striking sports suit in the well-dressed woman's wardrobe.

C. The Knockabout is the most tantalizing kind of beach cap; yet it is hard to tell whether or not beach wear is its only use. This hat is remarkably becoming to a great number of women and is quite like a charming street hat. It fits the head snugly, but the brim turns back off the face like a halo. Its lines are most effective. The color contrasts are stunning. Note, too, the bow at the neckline.

D. This cap has two important style features to recommend it. *Plaid* is the high style for 1931. The *beret* is a most popular fashion. This cap will add youth to any bathing costume.

E. The gypsy turban cannot help but win milady's fancy. It is varicolored and will go with almost any suit. It has the soft draping qualities that are so flattering to women. It has dash and sprightliness.

F. This hat has taken inspiration from a French creation. The tiny brim is cut out front and back so that each side may be adjusted to suit the face. The flat feather-like trimming is a distinctive 1931 fashion. This model will charm the women because of its femininity.

G. The fashionable little beret that is in every woman's sports wardrobe becomes a part of the swimming costume in a pert manner. Black combined with turquoise, pink, green, or white, and a trim little bow in the same color for chic will capture every eye.

H. The comfortable flat heeled rubber bathing slipper is undeniably smart with slim white bands trimming gay colors. This shoe has the convenient cross-strap for comfort.

I. The comfortable high heeled t-strap sandal will need no bid for popularity because it is much in demand. It comes in plain colors to harmonize or contrast with the rest of your costume.

J. How sportive these bathing slippers look. The wide cross-strap, the strippings, the colors give them an ultra-fashionable air that women adore.

### For the Children

The season's styles provide also for the tiny tot who enjoys the thrill of being "dressed up" at the beach or pool. Specially designed caps in reds, blues, and greens made to fit the girl or the boy of nine or ten are being shown.

Children's sizes in bathing slippers, colors, and trims just like those for the grown-ups are featured by the recognized leaders in the manufacture of bathing specialties. A ready market for this footwear exists; never before have these shoes so nearly matched the styles and the colors to be found in the chic creations for matrons and young ladies whose beach ensemble is ultra-smart.

Another bathing accessory holding enormous sales possibilities is the Float Aid especially designed for children's use. It is made of thin sheeted stock and, when inflated, supports the youngster's body in the water, inducing confidence by helping to overcome fear.

### Rubber Mattresses and Boats

The well-dressed swimmer, of course, is interested in other beach accessories, either for lounging on the sand or sport in the water. Such welcome devices include beach mattresses, which may be used also as rafts, and pneumatic boats.

The former boast extra thick maroon rubber on the outside and a braided cotton life-line run through brass grommeted flaps, so constructed to endure the rough uses from a good time in the water. The extra coating on these air-inflated water rafts will withstand also the abrasion of sand, shells, and stones, to provide an ideal bed on the beach. Nor will this mattress crack or bruise. It makes, too, an absolutely safe float for a sunbath on the water. The sanitary rubber surface of the mattress is, moreover, easily cleaned.

This accessory comes in three sizes; yet even the smallest will safely float a grown person on the surface. Any such mattress will support a group of people holding the life line.

The "Pak-Boat" likewise has a wide appeal. Two pontoons hinged together at bow and stern, calendered flooring, and two cushion balloon seats are outstanding features. Four well reenforced separate air chambers, one each in the two pontoons and the two cushions, offer more than enough support for the boat and its occupants. The sealing of the pontoons by pressure molding is another important characteristic of this pneumatic boat, which is made of specially woven fabric coated on the inside with pure rubber 1/32-inch thick, calendered to the fabric. Included in the equipment are oars, a brass foot pump, a life line, and a pack bag.

### New Sales Value in 1931 Bathing Hats

The new 1931 bathing hats will bring brisk profits to the clever merchant. They make a modern, interesting window display. They'll bring more customers into the store. They are salable in millinery departments which always need extra July and August business, in sport shops, and notion and toilet departments.

In other years display of bathing caps has been a difficult thing. They were merely bunched together on the counter. But now with new attractive display heads and boxes that make interesting display blocks available from the manufacturer, new sales opportunities present themselves.

# EDITORIALS

## Mass Production Not at Fault

THE contention that the recent world-wide depression has been largely the result of mass production is one of the least convincing of the many reasons given for the general let-down. Mass production is here to stay, as it means standardized quality output of manufactures, simpler, cheaper, and more rapid output. Nor does the accompanying mechanization of industry necessarily mean overproduction, as some claim. The latter happened with crude rubber, cotton, copper, wheat, and many basic materials, as well as with products turned out with the most improved machinery.

Overproduction of some farm products led to the United States appropriating hundreds of millions to keep the bottom from virtually dropping out of the market, although tire and other manufacturers had to shift for themselves in stabilizing prices. In time, of course, they should be much better off for the non-interference of government, especially if they resolve to produce for consistent profit as well as for glory and volume.

Without mass production the motor car and all the vast industries, with the road and other improvements, that have come in its train would have been impossible. The cure for mass production seems to be not less but more of it. The immediate problem is rather that of developing mass consumption, or increasing the masses' buying power, a problem which broad-visioned industrialists do not deem difficult of solution.

## Evolving a New Industry

IT IS held that the greatest economic need of the nation, something that will give it another fresh start, is an industry of such novel character and commanding interest as to absorb the bulk of our huge surplus funds as well as our overplus energies. A convenient analogy is the automobile industry, but, it is now overbuilt and overproductive and can hardly expect to attract much additional money from the country's $20,000,000,000 fund said to be available annually for investment.

Radio, aviation, chemical, and other promising industries only reply, "Perhaps," to the question, "Might you originate a new industry to fire the imagination of our savers and spenders on a scale comparable to that of the motor car industry?"

It is curious to speculate on what the rubber industry might be able to offer in this way. Could it provide even the basis for an industry which might attract the major part of our spare resources?

The history of the rubber industry indicates that it is not likely to blaze a great new trail. While for long it was regarded with some reason as "The Cinderella of Industry," helping all others but remaining comparatively obscure, the advent of the automobile proved in that astounding industrial development that rubber could be more of an indispensable ally than an anciliary factor.

Undoubtedly it has many big surprises in store, for example rubber latex, but that is more likely to be developed in some extraneous sphere. Even though rubber may not originate the eagerly awaited superindustry, experience assures us that it is more likely than many others to play a considerable part in the former's successful evolution.

## Scientific Papers Should Be Edited

SCIENTIFIC rubber disquisitions are becoming so numerous that most readers can hardly keep track of their titles, while the busy specialist seeking information finds their excessive length a severe tax on his time. Although no one expects them to be fascinating, there is no reason why they cannot be so scientific in form as in purpose, compact, lucid descriptions of new theories and processes.

The danger of being engulfed in the rising tide of technical literature can be averted by more concise composition and thorough editing of papers for publication. The saving in time, paper, type-setting, and volume by a reduction to a minimum of the aptly termed "prolixity constant" would benefit all concerned. A happy medium between the too brief abstract and the ordinary scientific monograph with its surplus verbiage is indeed "a consummation devoutly to be wished."

## When Silence May Be Golden

DESPITE the cheapness of tires rubber is said to account for 8 per cent of the cost of medium-priced motor cars and for more than that in the newer and more expensive models, which, because of their many rubber fitments, are nearly noiseless. Such extensive application of rubber is but the inevitable result of three decades of increase in speed, power, and acceleration. In addition to the great and more obvious advantage in hushed and comfortable operation afforded with balloon tires, car occupants now get the benefit of rubber insertions in fully forty points in a car chassis; and the end is not yet.

With jarring and friction minimized, driving fatigue will be reduced, and greater will be the urge to run cars farther. With higher speedometer records should come more frequent tire replacements. Thus may quieter cars prove a double boon, and silence indeed prove golden, especially if tire prices be kept on a really profitable level.

# What the Rubber Chemists Are Doing

## A. C. S. Rubber Division Meeting

THE spring meeting of the American Chemical Society, Rubber Division, was held at the Severin Hotel, Indianapolis, Ind., March 30 to April 3, 1931. The divisional program included twelve papers, which were read at the morning sessions April 1 and 2 and as a whole dealt more with the technology than with the chemistry of rubber.

Reports were submitted by the Physical Testing Committee and by the Papers Committee. The Division held its customary banquet Wednesday evening April 1. The banquet committee included S. J. Weller, chairman, J. E. Cady and E. R. Waite.

### Abstract of Papers

**Effect on Vulcanized Rubber Compounds of Immersion in Boiling Water.** Since vulcanized rubber finds many industrial applications in contact with or immersed in hot water, a study of its behavior in boiling water seems of considerable interest. In this work it is shown that some rubber compounds continue to absorb water and swell after 10,000 hours' immersion in boiling water, without showing any signs of disintegration. Various fillers have different effects on the water absorption. Of the thirty-five fillers tested, twelve decrease the water absorption and twenty-three increase it. Carbon black shows the lowest absorption, and ultra-marine blue the highest.

A determination has been made of the loss of cutting resistance brought about by prolonged immersion in boiling water. While there is not perfect agreement between amount of water absorption and percentage of cutting resistance loss, in general the stocks having the lowest water absorption show the least loss in cutting resistance, and vice versa. K. J. Soule.

**Some Properties of Carbon Black (1) Adsorption.** The DPG or similar adsorption test, although correlating better than the volatile matter test, is not as yet capable of predicting with precision the rubber compounding behavior of standard rubber carbon black. Carbon black adsorption is much more marked in the alkaline than in the acid range. While heat activated carbon blacks show a marked increase in DPG adsorption, heat deactivated carbon blacks show greatly reduced alkaline and slightly increased acid adsorption; these facts probably explain the anomalous iodine adsorption of heated blacks noted in the literature. In litharge compounds containing an excess of added fatty acid both heat deactivated and high adsorption blacks improve the cure, doubtless through removal of excess acid. For entirely unaccelerated rubber mixings heat deactivated (low adsorption) carbon black exhibits striking improvement in physical properties. The adsorptive properties of carbon blacks have been turned to advantage in the field of rubber insulation and of insulating oils. High adsorption, high oxygen, heat activated carbon blacks are shown to advance the cure of rubber mixings vulcanized with m-dinitro-benzene. Specially activated carbon blacks have been developed which show a higher (alkaline) adsorptive effect than the active chars now on the market. W. B. Wiegand and J. W. Snyder.

**Scorching, and Other Plasticity Changes in Rubber Compounds on Heating.** A method is described which employs the Goodrich plastometer for detecting the initial stages of vulcanization of uncured rubber compounds. Reduction in plasticity, at standard room temperature, of test pieces previously heated for various intervals at selected temperatures is used to determine the degree of cure and thus to estimate safe operating temperatures and periods. Examples of the application of the method to a variety of compounds are presented. Other temperature effects, such as heat stiffening and softening, which have not previously been reported, are illustrated. E. O. Dieterich and J. M. Davies.

**Value of Softeners in Tread Stock.** The effect of three common softeners on the wearing qualities of tire treads is shown and comparison of road wear ratings is made with the common laboratory tests. The effect of any quantity of either pine tar or mineral rubber is to decrease the road wear resistance. An optimum ratio of 4 per cent stearic acid is shown to give the best tread wear. The common laboratory tests give results in the same direction as the average road wear; the 30 per cent slip abrasion test gives the best agreement. M. J. DeFrance and W. J. Krantz.

**Effect of Various Factors Upon the Rate of Deposition of Latex on Porous Molds.** The effects of pressure, rubber concentration of latex, temperature, and hydrogen ion concentration upon the rate of deposition of latex on porous molds are described. Pressure, rubber concentration, and temperature were found to be negligible factors in comparison with hydrogen ion concentration. By adjusting the pH of the latex to 6.1, it was found possible to obtain aggregation of the latex particles and a marked increase in rate of deposition. H. W. Greenup.

**Solubility Fractionation of Natural Rubber.** This paper describes a method of separating the pure, nitrogen free rubber hydrocarbon from crude rubber, using a benzene-alcohol mixture as solvent, and obtaining fractions by alternately cooling and redissolving. By repeating the process of solution and precipitation several times, absolutely nitrogen free rubber is obtained. The final fraction contains the protein in concentrated form. Temperature solubility diagrams for nitrogen free rubber, crude rubber, and synthetic rubber (sodium rubber) are included. Thomas Midgley, Jr., Albert L. Henne, and Mary W. Renoll.

**Permeability of Rubber to Air. II. Effect of Stretch, Thickness, Milling, Compounding Ingredients, Kind of Crude Rubber, and Temperature of Vulcanization.** In continuing the previous study of the effects of various factors on the permeability of rubber to air it has been found that permeability varies inversely with thickness, and with the volume of compounding ingredients present. Factors having little or no influence on permeability include milling, kind of crude rubber used, and temperature of vulcanization. The permeability of rubber was found to increase with stretch; the major factor involved probably is the accompanying reduction in thickness. The applicability of certain of these results to the improvement of the air retaining capacity of automobile inner tubes is obvious. V. N. Morris.

**Value of the Rubber Hydrocarbon in Reclaimed Rubber.** The rubber hydrocarbon of reclaimed rubber is evaluated by road tests in a series of stocks using constant composition as derived from analysis of the reclaim. The hydrocarbon from reclaim is at its maximum value in the 100 per cent reclaim stock where the abrasion is 50 per cent as good as the all new rubber stock. It is not possible to compensate for the degrading effect of the reclaim because any method proposed can also be applied to the non-reclaim stock with corre-

sponding improvement. C. W. Sanderson.

**X-Ray Diffraction Study of Chicle.** A comparative study of the X-ray diffraction patterns for whole chicle, both crude and refined, and for the several fractions into which chicle may be conveniently separated brings out the following facts:

1. Whole crude chicle is a mixture of at least three crystalline constituents, the gutta, the resin, the "benzine insoluble," and one or more amorphous fractions. 2. Refined chicle is essentially the same in structure as is crude chicle, except that the gutta is probably highly dispersed and amorphous. 3. Calcium oxalate monohydrate exists in chicle as such and is the crystalline constituent of the benzene insoluble fraction. 4. Chicle gutta is identical with gutta percha and balata; its exact nature depends on how one interprets the facts relating to the last two. 5. The structural units of chicle do not assume a preferred orientation under tension, and chicle differs in this respect from rubber. Charles W. Stillwell and George L. Clark.

**X-Ray Studies of Gutta Percha and Balata.** New X-ray diffraction data for gutta percha and balata are given and considered in the light of V. Susich's recent conclusion that gutta percha and balata are identical and exist in two crystalline forms. The data also support the assumption that gutta percha is a mixture of balata and another crystalline constituent. This assumption is in some respects to be preferred to that of V. Susich. Although the relation between gutta percha and balata has been definitely established and there may be no ultimate difference between them, it is pointed out that the majority of specimens examined of material classified commercially as balata produce a diffraction pattern different from that of gutta percha, a fact of practical significance. Charles W. Stillwell and George L. Clark.

**Microturbidimeter for the Determination of the Rubber Content of Latex.** It is desirable to devise a method for determining the dry rubber content of latex, which will be both more rapid than the two trial coagulation methods and more precise than the hydrometric method. The turbidity of latex, depending upon the volumetric number and size of the suspended rubber particles, offers a satisfactory criterion for the determination of the rubber content of latex. A microturbidimeter, herein described, has been adapted to such determinations. It permits more rapid determinations of the rubber content than the two trial coagulation methods. Its precision is less than the lengthy trial coagulation method, involving coagulation, creping and drying, but is probably greater than that of the shortened trial coagulation method involving only coagulation and creping. Its precision is approximately one per cent rubber in 35 per cent latex. The turbidity of latex obeys the turbidity dilution law for rubber content values less than 15 per cent. The use of color filters, transmitting the shorter wave lengths of light, minimizes the effects of a difference in the effective mean particle size of different kinds of latex. S. D. Gehman and J. S. Ward.

**Effect of Scrap Drying Temperature Upon Reclaimed Rubber Quality.** Devulcanized tube and whole tire scraps were subjected to temperatures of 260° F. and 275° F., respectively, and dried to a final moisture content of 2 per cent, preparatory to processing into finished reclaimed rubber. With increase in drying temperature the acetone extract remains unchanged while chloroform extract increases. With the higher temperatures the reclaims show a progressive increase in softness and tackiness, the highest temperatures used appearing to be the practical top limit for ease of processing. Compounds containing approximately 35 per cent reclaim showed no detrimental normal or aged stress-strain characteristics. A maximum ultimate drying temperature of 250° F. to a minimum moisture content of 3 per cent is suggested for all standard types of devulcanized rubber scrap, with the recommendation that much lower ultimate drying temperatures be maintained and that more rapid drying be promoted by the use of higher temperatures in the wet end of the drier. Henry F. Palmer, George W. Miller, and John E. Brothers.

## Boston Group

THE meeting of the Boston Rubber Group, Rubber Division, A. C. S., held at the University Club, Boston, Mass., on March 5, was one of exceptional interest. It was attended by 180 members and guests, who were comfortably seated at group tables in the large dining hall. The guest of honor and principal speaker was Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, who spoke on the relation of science to industry. Dr. Compton is renowned as an educator and for his research accomplishments as a physicist. He spoke only from notes; therefore only the chief points of his address can be given as follows:

People as a rule do not realize how new are many branches of engineering accepted today as established matters of fact. Each engineering branch, however, embodies the application of principles of science to some industrial need, which serves as its distinctive background. The most ancient branch of engineering is civil, fundamentally relating to measuring and mapping the earth's surface and making it more suitable for human habitation. Next in age to civil engineering comes mechanical, followed by electrical and chemical engineering and other branches of more recent date.

The lecturer cited numerous examples showing how every engineering development depends on the results of long investigations by scientists. Included in these instances was the development of radio tubes or valves founded on the escape of negative electric current liberated by heating a metallic terminal, a fact first observed experimentally 200 years ago. Other engineering and industrial accomplishments dating since the World War, all of which grew out of scientific research, are improvements in electrical transportation, piping natural gas from West Virginia to the Atlantic seaboard, and new and better electric lamps. These and similar practical developments from scientific research have brought many present-day economic advantages without increasing unemployment. This answer is substantiated statistically in a recent publication.[1]

All of these statements prove that science and engineering should not take a holiday, but should continue under competition at an increased rate because to stop is to retrograde.

Dr. Harry L. Fisher, of the General Laboratories of the United States Rubber Co., Passaic, N. J., speaking on "What's New in Rubber Chemistry?" discussed the most important scientific investigations in the chemistry of rubber published during the past year. Some of the most interesting results are the following:

The yellow coloring matter of pale crepe has been shown to consist of the hydrocarbon carotene. This is widely distributed in the vegetable kingdom. It is found in carrots, whence its name, and gives natural butter its yellow color.

The heats of combustion of the purified hydrocarbons of rubber, gutta percha, and balata are identical; therefore the difference in their structure is most likely due to stereoisomerism of polymerization. Masticated rubber also gives the same heat of combustion.

Rubber has been crystallized and the crystallization can be repeated at will at —80°C. The fibrous nature of stretched rubber was illustrated by slides. Rubber will completely dissolve in solvents which ordinarily only swell it, if the time is extended to three to four years. The molecular weight of the unchanged rubber hydrocarbon as obtained from viscosity measurements is about 200,000. The rubber hydrocarbon is probably the *trans* form, and the gutta percha and balata hydrocarbon the *cis* form. Hydrorubber with a molecular weight of about 30,000 is somewhat elastic; whereas the lower molecular weight hydrorubbers are syrupy. High temperatures produce oily hydrorubbers, which are being used in Germany as the best transformer oil obtainable.

Soft vulcanized rubber, as well as hard rubber, gives off hydrogen sulphide even at room temperature. Fossil rubber in German lignite coal was illustrated, and mention was made that the fine hair-like strands in which it is formed are from plants belonging to the *Ficus* genus, which at the present time grows in Africa. Fatty acids instead of solubilizing zinc oxide, litharge, etc., probably act chiefly in causing better dispersion of the oxides, thus giving a larger surface for action.

The experimental results of allowing slabs of rubber to vulcanize at room temperature were presented. The slabs were embedded in sulphur, and they dissolved it in the cold. In 384 days the combined sulphur rose to 2.93 per cent in spite of the fact that the slabs never had been heated with any sulphur even on the mill. The tensile was 4,160 pounds per sq. in.

(*Continued on page* 84)

[1] "The Purchasing Agent," Feb., 1931.

# Impregnability of Cord Threads with Rubber

THE research results obtained by E. A. Hauser and M. Hünemörder[1] recently were published in German and English.[2] The procedure in comparing the relative rubber impregnation of cotton cord threads under various conditions was as follows:

A. The preparation of fabric layers or weftless cords which are enveloped in a sufficiently thick (visible) layer of rubber, such as, for instance, fabric layers coated on both sides with or without previous impregnation, sections of finished tires, etc. The specimen to be investigated is fixed in hard setting paraffin. When the paraffin is firmly set, it is cut into blocks in such a manner that the specimen under examination lies, as far as possible, in the middle of a block. The block is then mounted on a sliding microtome.[3] When it has been set at the right height for cutting, and the upper surface has been cut smooth, the top of the block is treated with carbonic acid till it is frozen to a depth of about 200 $\mu$. The slide is then rapidly moved under the knife, and a microsection of 20—30 $\mu$ in thickness is cut. This microsection is now spread out in tepid water and laid on a microscope slide.

After the adherent moisture has been cautiously evaporated, the slide with the preparation is immersed in clean concentrated sulphuric acid. The paraffin is to a large extent destroyed through the action of the sulphuric acid, but all parts of the fabric which are not impregnated with rubber are carbonized. The rubber mass itself is stained a characteristic reddish brown color. The preparation is left for 1—2 hours in the sulphuric acid and is then washed with clean concentrated sulphuric acid until all soluble or carbonized ingredients have disappeared. The preparation then can either be subjected at once to microscopic examination or be finished as a permanent preparation by embedding in Canada balsam or some similar substance.

B. The preparations of specimens which are not enveloped in a rubber coating of any considerable thickness, such as, for example, cord fabrics, weftless cords, or single threads, pre-treated with benzine solution or latex.

The specimen is laid in a 7 per cent solution of gelatine, which is then solidified by cooling. The congealed gelatine is then cut into blocks in the manner already described, and these are mounted on a freezing microtome. By means of suitable refrigerating mediums, such as carbonic acid, the mounted gelatine block is completely frozen, and a microsection is then cut. The section is laid on a microscope slide and, as above described, is subjected to the action of concentrated sulphuric acid. The gelatine in which the preparation is enveloped is hereby completely destroyed so that, after it has been washed, the specimen is ready for examination.

The following materials adapted for the solution of the main problem were subjected to investigation in the form of microsections:

1. A thread soaked in a 5 per cent benzine rubber solution.
2. The same thread after treatment with sulphuric acid.
3. A thread soaked in 33 per cent ammonia latex.
4. The same thread after treatment with sulphuric acid.
5. Dry cord threads on to which a rubber compound had been frictioned.
6. The same weftless cord after treatment with sulphuric acid.
7. Cord fabric previously soaked in benzine rubber solution, then covered on both sides with skim coats by friction calender and afterwards treated with sulphuric acid.
8. Latex cord fabric coated on both sides and treated with sulphuric acid.
9. The same cord fabric as in No. 7, coated on both sides and treated with sulphuric acid after vulcanization.
10. The same cord fabric as in No. 8, coated on both sides and treated with sulphuric acid after vulcanization.
11. A dry cord fabric laid in sheets and treated with sulphuric acid after vulcanization.

The authors cite the following facts from their earlier researches for they have an important relation to the present study:

1. Rubber which has undergone no mechanical treatment before vulcanization ("unbroken" rubber, such as latex, for example) exhibits scarcely any flow effect at all.
2. Rubber which has been pre-kneaded by mastication exhibits flow effect in proportion to the degree of mastication.
3. Rubber obtained by evaporation of benzine rubber solution exhibits flow effect to a degree practically equal to that of strongly masticated raw rubber.
4. The addition of accelerators diminishes the extent of flow and especially the time of flow, and the greater the strength of the accelerator, the greater this effect.

### Summary

The results of this latest investigation are summarized as follows:

A fabric previously soaked in a benzine rubber solution already is completely impregnated with rubber before vulcanization; while a fabric soaked in latex is only covered with an external coating of rubber even after vulcanization. When non-treated threads are embedded in rubber sheets, or rubber compounds are frictioned on to dry fabrics, there is no impregnation previous to vulcanization, but impregnation takes place in a high degree during the process of vulcanization in consequence of the flow of the rubber.

With the establishment of these facts we consider that we have proved that the degree to which weftless cords can be impregnated in a vulcanized state depends not so much on whether the fabric has been previously treated or not, but solely on the physical condition of the rubber used. With rubber in the form of a benzine solution, or a solution in any other solvent, a more or less perfect impregnation may be reckoned on, while, if latex is used, merely an external coating of the thread and no impregnation is the result.

The question as to whether cord fabrics and weftless cords prepared with benzine rubber solutions or those prepared with latex can claim superiority in regard to strength, elasticity, durability, etc., is not decided by the results of the investigations here described, nor, indeed, did the solution of this question lie within the purpose of this article.

[1] Colloid Chemical Laboratory of the Metallgesellschaft A. G., Frankfort-on-Main, Germany.

[2] *Metallgesellschaft Periodic Rev.*, Jan., 1931, No. 5, pp. 13-18.

[3] E. Leitz's large sliding microtome.

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# Technical Communications

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## Micronex W-5 in Insulating Compounds

A PHASE of our research relating to the inner properties of carbon black from the viewpoint of adsorptive characteristics has to do, not with the elimination of such properties, but with their useful applications. The result of this phase is Micronex W-5, the form especially made for rubber insulation.

Micronex W-5 in proportions approximating 10 per cent on the total rubber hydrocarbon will improve electrical breakdown, resistivity, and power factor, with but slight change in dielectric constant. If any one of these dielectric properties is regarded of especial importance, it is possible to determine the optimum proportion for maximum results by testing a series of Micronex W-5 concentrations: for example, 4, 6, 8, 10, 12, and 14 per cent on the rubber hydrocarbon. Although each dielectric property requires a slightly different dosage to bring out the absolute maximum, 10 per cent will, in general, be found quite satisfactory. This dosage, in addition to improving dielectric properties, will also result in important improvement of tensile strength and increased toughness of the stock.

Greater physical improvement may be obtained without danger to the dielectric properties when considerably higher proportions of Micronex W-5 are employed. From 20 to 30 per cent, to the total rubber substance, is used without effecting reduction of the electrical properties, and with striking improvement in rigidity, toughness, tear-resistance, and resistance to pinching.

The discovery of this new application of impingement carbon black is destined to revolutionize the compounding of insulated wire. Hitherto black was almost universally regarded as injurious because it was generally known that carbon black is a fairly good conductor of electricity. More recently regular Micronex was used in wire compounds through its presence in reclaimed rubbers, and for several years it has been realized that a limited amount of carbon black can be used if properly dispersed. It has also been applied by the addition of black through compounded reclaims.

Micronex W-5, however, presents outstanding advantages which are regarded as due to its selective adsorption, or removal of the final trace of moisture and of electrolytes present in all rubber compounds. To secure the maximum effect Micronex W-5 must be thoroughly dried and mixed while warm, in order to prevent moisture regain because the presence of moisture naturally reduces its effectiveness.

Micronex W-5 possesses full reenforcing properties and may be applied to outside wire cover work as developed some years ago. Compounds containing tire tread proportions of Micronex W-5 are standard for this work. It is also regularly used in compounds employed next to the wire in the case of all low-tension insulated wire compounds, including stocks ranging from code wire to the so-called 40 per cent compounds, both with and without reclaimed rubber. Data from Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

## Retardex

IT IS generally acknowledged that low temperature curing is a distinct advantage, producing physical characteristics in the rubber greatly superior to those from old-type high temperature cures. Unfortunately many rapidly curing accelerated stocks are somewhat difficult to handle in the factory, particularly where rigid control is not practiced.

Low temperature curing is considerably simplified by the use of Retardex, a material that satisfies a longfelt want of the rubber industry. It functions to raise the critical temperature without appreciably affecting the time-tensile curing curve. Consequently this material simplifies milling and calendering rapidly curing stocks by eliminating the liability of scorching and the danger of shelf curing of stocks thus protected.

Retardex is a finely divided light colored solid with no staining effect. It has no tendency to deteriorate in storage and is easily dispersable in rubber. Thus it can safely be used in white or pastel colors. The master batch method of handling is recommended, carrying from 12½ to 15 per cent of Retardex. For most accelerators having a tendency to scorch it is advisable to use from 0.5 to 1.0 per cent to the batch, although in some instances the proportion may be less. In general the amount used will be determined by individual factory conditions and the nature of the accelerators employed and the degree of safety desired.

Retardex has a pronounced effect on many of the popular accelerators, namely: Dithio carbonates and salts, Captax, Captax salts, Captax plus DPG, Captax plus aldehyde amines, Tuads plus aldehyde amines, SPDX, plus Phenex, Ureka, aldehyde amines, Vulcanol, etc.

With most accelerators it has very little effect on the time-tensile curve. For example, a tread stock containing 0.85 per cent Captax scorches much less easily when 0.85 per cent Retardex is added; yet the time-tensile curves of two such stocks are essentially identical. With other accelerators the time-tensile curve is changed somewhat, but the maximum tensiles are about the same. In other words, a little longer time is required to arrive at the maximum tensile. Retardex has no effect on aging characteristics. Data from The C. P. Hall Co., Akron, O.

## Accelerator for Insulated Wire

THE use of aldehyde amines as accelerators for insulated wire stocks has not progressed greatly until recently. The reason being that in general this type of accelerator did not produce stocks having superior di-electric properties. Many of them did not disperse properly; others caused scorching in the tubing machine; some did not improve the aging properties, necessitating using auxiliary antioxidants.

In order to meet this situation R & H 50-D was developed especially for the wire trade. This material is so processed that the above defects have been entirely eliminated. Dielectric properties of insulation containing R & H 50-D are readily produced well above specifications.

Being a powder soluble in rubber, it disperses readily. Because of its freedom from action at low temperatures no difficulty is experienced from scorching or prevulcanization of raw stocks. Aging tests conducted in very warm climates have demonstrated conclusively the excellent aging properties of wire insulation containing this accelerator. It also resists to a considerable degree the action of corona discharge.

This combination of properties has made R & H 50-D also particularly suitable for linemen's gloves, rubber blankets, and all other work where good dielectric properties with superior aging are required.

Cheap Code stock formula containing R & H 50-D:

| | |
|---|---|
| Smoked sheet | 23.0 |
| Comet reclaim | 154.0 |
| Mineral rubber | 115.0 |
| Sulphur | 5.7 |
| Litharge | 15.4 |
| Whiting | 71.2 |
| R & H 50-D | 2.0 |

Cure, 60 minutes, at 22½ pounds' steam pressure.

Forty per cent specification stock containing R & H 50-D:

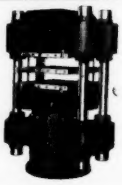
| | |
|---|---|
| Smoked sheet | 41.00 |
| Zinc oxide | 30.00 |
| Whiting | 20.00 |
| Paraffin | 2.00 |
| Litharge | 3.00 |
| Sulphur | 2.00 |
| R & H 50-D | 0.75 |

Cure, 60 minutes at 22½ pounds' steam pressure.

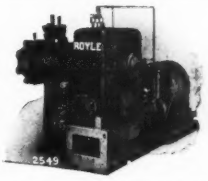
Data from The Roessler & Hasslacher Chemical Co., 10 E. 40th St., New York.

## Z-88-P

THE ultra accelerator Z-88-P, a piperidine derivative, is a powder easier handled in the plant than its earlier form Z-88, which was mixed with stearic acid. Z-88-P is much less inclined to scorch and is very good for white stocks. In comparing them weight for weight at temperatures from 20 to 50 pounds of steam there is no difference in acceleration effect between the new and the old forms of Z-88. Data from The Rubber Service Laboratories Co., Akron, O.



# New Machines and Appliances




## Heavy Duty Tuber

THE popular 6-inch tubing machine here pictured is designed with special attention to the stock screw, its water cooling, and the cylinder jacket. These features are outstandingly different from those previously used in machines of this type and account for the success of the new tuber.

The screw is made from special high grade forged steel, milled from the solid, bored and water cooled. It is easily removed from the front of the machine. A long rearward extension of the screw holds it in better alinement in the cylinder, thus prolonging its life and that of the cylinder bushing.

The cylinder of heavy cast iron has special cooling features for better stock control. The specially designed hopper provides for mechanical feeding with minimum backing up of stock. The steam and water connections are made at one point on top of the cylinder. Stress rods holding the die head to the cylinder extend to the gear housing, thus carrying the end thrust of the screw direct to the thrust bearing and relieving the cylinder of excess strain. A space between the end of the cylinder and the thrust bearing stuffing box prevents the rubber from working into the thrust bearing and excess oil from flowing into stock at the rear end of the cylinder. The thrust bearing is Rollway self-alining type, heavy enough to stand extreme service conditions.

The drive of the machine is modern in all respects. It is composed of Falk standard herring-bone gears and pinions, high speed and intermediate shafts, mounted in roller bearings, and the low-speed shaft on Rollway roller bearings. All gears are enclosed in a rigid oil tight case, firmly bolted to the bedplate. The sturdy cast iron base under the cylinder and the drive units has a pad for attachment of the motor base plate. National Rubber Machinery Co., Akron, O.

**TYCOS Compensated Instrument**

## New Compensated Tubing

IT HAS long been the endeavor of temperature instrument engineers and designers to eliminate possible error in the functioning of temperature instruments, error which is due to temperature conditions surrounding the tubing connecting the bulb to the instrument.

Many methods have been attempted, depending on auxiliary levers or springs, but they have proved unreliable because of mechanical failure. A new and revolutionary type of capillary tubing has been produced in which compensating qualities have been incorporated in the material of the tube itself. No parts are added to the mechanism of the instrument, and no adjustments are necessary during its life.

The new method consists of so proportioning the volume of mercury in the tubing to its coefficient of expansion and to the size of the alloy wire that any change in the volume of mercury, resulting from external temperature changes, is accurately compensated. The adjustment thus is made for each varying exposure. It is not necessary to compensate the instrument for the average external condition along the length of the tubing.

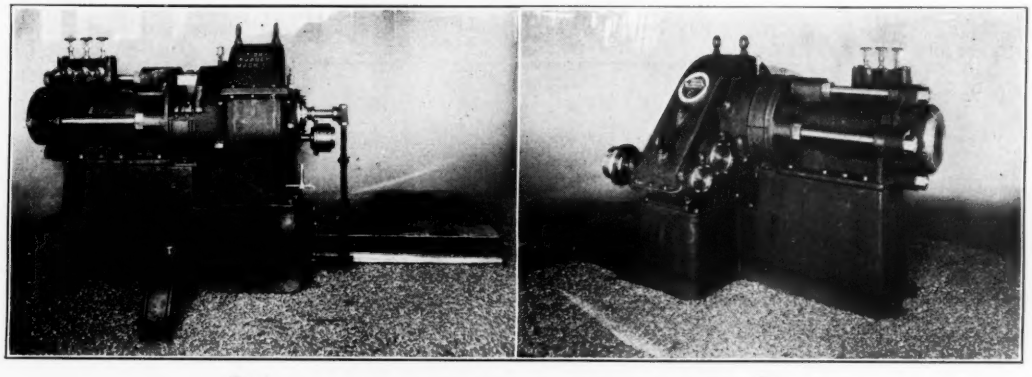
This new $\frac{7}{32}$-in. O. D. compensated tubing is the latest development of extremely efficient mercury actuated tube systems. Combined with rugged welded joints and the bulb of machined alloy steel, it comprises one of the most sensitive as well as the most lasting temperature responsive elements in use today. Taylor Instrument Companies, Rochester, N. Y.

## Timer for Individual Vulcanizers

UNTIL recently cycle controllers or timers for individual tube and tire vulcanizers had the cam cut so that it started the cure at the zero mark, went through the complete cycle of operations, and having made a complete revolution, came back to zero at which point the clock was stopped. Obviously the length of cure was definitely fixed by the reduction gearing between the cam and the electric clock whose revolution time could not be altered. Also the timing of events was permanently decided by the contour of the cam. Changes in cure length were accomplished by substituting new gear wheels and changes in intermediate timing by recutting the cam.

Insistent demand for a quick and easy means of adjusting the timers in this respect and one which would not involve buying and waiting for new gears has now been met by the new adjustable timer, here pictured, which is constructed in the following manner.

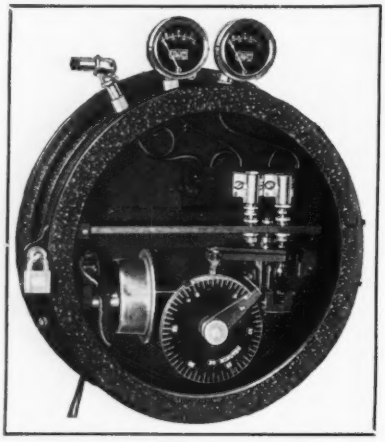
Instead of an electric motor capable only of revolving counter-clock-wise a reversible electric clock is used which revolves counter-clock-wise during the first half of the cure, then reverses automatically and turns the cam clock-wise back to zero where it again reverses ready for the next cure and immediately stops. In this timer, it is possible to change the cure length in a few seconds because it is only necessary to reset the reversing arm at the new time on the cam, which is, of course, graduated



Front Rear

**National Rubber Machinery Six-Inch Tuber**

in minutes. The reversing mechanism is extremely simple, and an endurance run of many thousand repeated cycles testifies to its dependability. To make adjustment complete the period during which the tube is venting has also been made fully adjustable by having a separate cam sector, readily loosened, shifted, and relocked, govern this operation. Those portions of the compound cam which govern the operation of the closing cylinder, locking cylinder, etc., do not require adjustment as the timing of these operations is always the same regardless of changes in the length of cure.



**Tagliabue Timer**

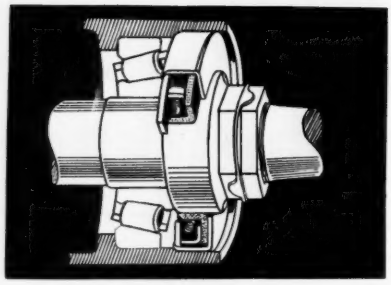
In this controller a worm drive is used between clock and cam to eliminate the back-lash present in spur gearing. Ball bearings are used not only for the two worm shaft bearings but also for the cam spindle, thus assuring perfect running at all times. A friction piece makes it possible to move the cam manually should this be desired. C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

## Oil and Grease Retainer

MECHANICAL engineers universally accept leather as the most efficient material obtainable for oil and grease packing purposes on rotating surfaces. Leather grease and oil packings seldom, if ever, wear out from frictional resistance, and not only perform their duty with the utmost efficiency but without the least wear or injury to the shaft or surface on which they are sealing.

An oil retainer offering all the advantages of the leather packing together with other scientific features is here illustrated. The device is a compact, self-contained unit with stamped steel parts, leather packing member, and spring completely assembled. Installation consists merely of press-fitting into a simple machined recess in hub, housing, or bearing retainer. The unit incorporates the floating principle, which enables it to overcome any possible misalinement or eccentricity which may exist or develop. When properly applied, the oil retainer absolutely seals out dust and retains 10 per cent of the lubricant.

On an application where it is of prime importance to keep the oil within the bearing chamber without any leakage whatever, as are most industrial and automotive applications and where there is not much dust present, the lip of the leather should be toward the oil instead of the dust. On applications where it is necessary to keep both the lubricant in and the dust out, it is general practice to use two seals: one with the lip of the leather toward the dust and the other toward the oil. The Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago, Ill.



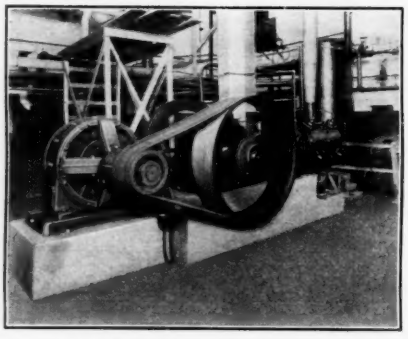
**"Perfect" Oil Retainer**

## V-Belt Drive

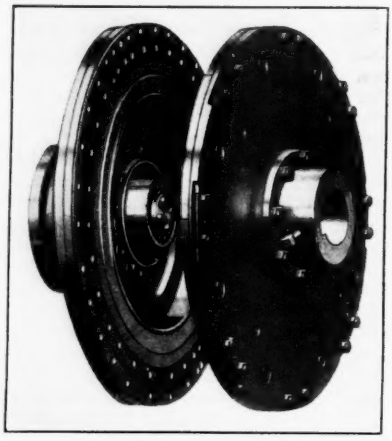
VARIOUS constructions of V-drive transmission belts have been evolved in recent power developments. One of special significance and value is here illustrated. It is stated that this combination gives a positive grip without binding or backlash, which transmits about 99 per cent of the applied power at high speed ratios over short corners without idlers. Various other practical advantages claimed are long life, low maintenance cost, quiet operation, small floor space needed, constant speed, no break downs, and elimination of lubrication and belt dressings.

The construction of this V-belt is shown in the illustration. The upper section of the belt is in tension as the belt flexes around the sheave and is made of highest grade rubber. The central section or neutral zone is made of four bands of high power capacity cords with strong resistance to fatigue. The bottom or compression section is also of highest grade rubber. The entire belt is enveloped in plies of fabric, two on top and sides and three on the bottom. These fully protect the load carrying core.

The required number of V-belts to make up a multi-V-drive are assembled on carefully grooved sheaves machined and finished to present smooth surfaces on which the belt operates. The wedging action between the belts and the grooves results in a slipless grip which compensates for but differs from initial belt tension in a flat belt drive. The mathematical relation of the grooves to the molded shape of the V-belts results in an effective conformity assuring maximum power transmission efficiency. Worthington Pump & Machinery Corp., 2 Park Ave., New York, N. Y.



**Multi-V-Drive Belt Section**



**C.-H. Magnetic Clutch**

## New Magnetic Clutch

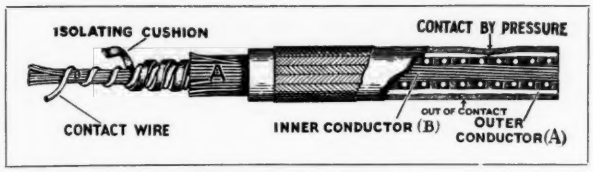
BETTER and more consistent operating characteristics, easier installation, greater safety, and easier access to parts which may have to be renewed, are claimed for a new line of magnetic clutches, one of which is pictured. These clutches are known as "Type L" because the cross-section of the armature is "L" shaped to fit around the magnet coil. This construction gives a greater and steadier magnetic pull throughout the life of the lining.

The magnet coil is wound on a sheet metal form and vacuum impregnated before it is inserted in the field member. The coil is locked in place by four mounting studs which extend through the field casting. Loosening the four studs allows removal of the entire coil.

A centering roller bearing mounted in the field member protrudes so that it fits into a recess in the armature hub and forms a common support for both clutch members; yet it allows either member to revolve independently of the other when disengaged. Perfect alinement and concentric engagement of the members are thus assured.

A definite improvement has been made in the design of the collector rings for these clutches. The collector rings are made of brass to prevent corrosion and are mounted away from the hub on four insulated studs; thus it is practically impossible for sufficient dust to collect to cause creepage between the rings. Two carbon brushes are used on each collector ring so that one brush is always in position to give good contact without arcing. A lining wear indicator shows the operator when the lining has worn to a point where it must be readjusted. Cutler-Hammer, Inc., Milwaukee, Wis.


# New Goods and Specialties


**Bishop Contact Cable**

## Electric Contact Cable

THE unique feature of the electric cable here pictured is that it will serve as an electric switch at whatever point it may be compressed. This feature results from the following make-up. Two conductors, enclosed by the outside insulation, are left bare but separated from each other by an isolation cushion of very high grade rubber. When the cable is pressed, this cushion yields and permits the outer conductor to contact with a wire which is always in contact with the inner conductor. The circuit is thus closed. On release of the pressure, the isolation cushion returns the outer cushion to its normal position and thus opens the circuit.

This cable is generally used with light circuits transformed to a maximum of 48 volts. It is waterproof, dustproof, and can be made acidproof. By the use of this cable and a relay switch, it is possible to control any or all of a group of machines wherever the fingers of the operators press the cable.

Its usefulness is apparent in many industrial and other situations where remote and instant control is essential. Bishop Wire & Cable Corp., 420 Lexington Ave., New York, N. Y.

## Rubber Industrial Goggles

MEN in shops who must wear correction spectacles need protection when they perform eye-hazardous work. But to have special goggles with proper lenses made for them is very expensive. The Willson Products, Inc., Reading, Pa., in consequence, designed a rubber safety goggle, known as the Over-all, for such workers. It is a regular safety goggle, but made to fit right over ordinary spectacles. It affords a close comfortable contact with the face, yet does not interfere with the adjustment of the glasses underneath. It is well ventilated with indirect ventilators.

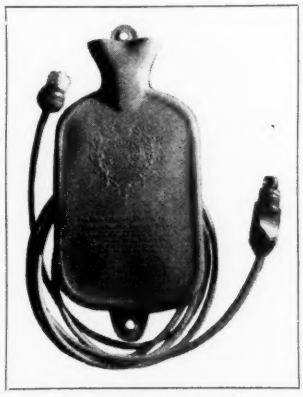
Over-all is made in several styles. X30, for the chemical worker, comes without ventilators and has plain, clear, unhardened glass. For chippers, grinders, etc., Style X31, ventilated and fitted with super-tough lenses, is designed. Laminated, non-shatterable glass is available in Style X33. Welders are offered Style X70, which has

**Over-all Goggle**

three indirect ventilators to keep out all stray sparks and light, and is fitted with special weld glass in any desired shade.

## Electric Hot Water Bottle

THIS Age of Electricity has claimed even the hot water bottle, bringing good news to millions—a hot water bottle that stays hot! No more arising in the chill of night to refill a bottle turned cold; no more shrinking away from a clammy bag in the early morn—not with the Davol electric hot water bottle. To this convenience is added greater curative powers, for this improved product combines the advantages of the water bottle with those of continuous electric heat.



**Davol No. 88 Bottle**

The bottle, using ordinary alternating household electric current (110 volts), automatically heats itself and automatically stays warm. All that the user must do is to plug in a convenient electric socket, and the thermostatic control does the rest.

Thus the bottle is convenient, safe, and economical to use. It does away with dangerous wire mesh. Then too it will not overheat.

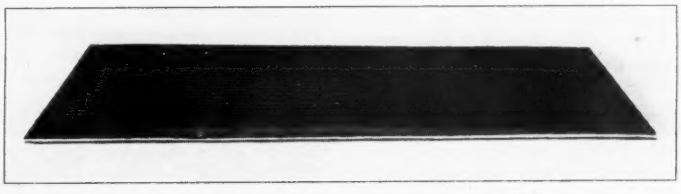
It has many uses. People sleeping outdoors in cold, damp weather should have their bed sheets warm. For sleeping porches, in sanatoriums, hospitals, and the home this bottle will prove invaluable.

The new Davol electric hot water bottle, No. 88, is a seamless molded product made in two-quart size from heavyweight bright red stock. Its extra-heavy edges insure long service. Its heating unit, furthermore, has won the approval of Good Housekeeping Institute, the Underwriters' Laboratory of the National Board of Underwriters, and the Hydro Commission of Canada. Davol Rubber Co., Providence, R. I.

## Electro Safety Pad

THE operator working underground is entitled to just as much protection as the lineman on the pole for the pole acts as an insulator, and the worker in a damp manhole is in full need of every adequate protection. To safeguard such persons the Melflex Products Co., Akron, O., offers its special electro safety pad for use in underground construction and distribution.

This safety mat is composed of three layers. The top one, which is corrugated, and the bottom are of a rubber compound, while the middle section is pure gum rubber. Because of its special construction the mat, according to its maker, will outwear half-dozen ordinary blankets and at the same time provide the operative with a non-slip safety pad that is easy and convenient to handle. It is meeting with the approval of many public utility companies and has been approved by the Bureau of Safety of Chicago.



**Melflex Rubber Safety Mat for Underground Construction and Distribution**

# Editor's Book Table

## Book Reviews

**"Government Control of Crude Rubber."** The Stevenson Plan. By Charles R. Whittlesey. Princeton University Press, 1931. Cloth, 235 pages, 6 by 9 inches. Indexed.

This account of the attempt to control by the Stevenson Plan the price of crude rubber, and its inevitable failure is one of great interest and value to economists. The author outlines the history of plantation rubber, the background and development of the Stevenson Plan, price movements under the plan, and administration features. The effects of restriction are shown in its reaction upon the producing countries, the principal consuming countries, and the principal investing country. In the two concluding chapters the author discusses important theoretical considerations involved in the problem of governmental control generally. Rubber growers in particular will find this volume profitable for study.

**"Rutherford's Planter's Note Book."** Useful memoranda for everyone connected with the planting industries of the Middle East. Ninth Edition. The Times of Ceylon Co., Ltd., Colombo, Ceylon. 1931. Cloth, 908 pages, 5¼ by 8¼. Indexed.

This is a compendium of information, of building, and mathematical data of great value to those in the planting industries such as tea, coffee, rubber, and coconuts. The data are supplemented with monographs on cultivation and manuring, fruit and shade trees, medical and legal information, insurance, animal diseases, electrical communication, and accounting.

**"Standards Year Book 1931."** Compiled by The National Bureau of Standards, George K. Burgess, Director. Bureau of Standards Miscellaneous Publication No. 119. United States Government Printing Office, Washington, D. C., 1931. Cloth, 399 pages, 5½ by 9 inches, Indexed. Price $1.

This is the fifth issue of the Standards Year Book. It contains outlines of standardization activities and accomplishments of the National Bureau of Standards and other agencies of the Federal Government, States, counties, and municipalities, as well as those of technical societies and trade associations. The Bureau of Standards' work on the chemistry and testing of rubber is outlined, also the work of the Rubber Manufacturers Association in cooperation with the National Automobile Chamber of Commerce, the Society of Automotive Engineers, and the Federal Specifications Board.

Similarly the rubber specifications work is cited of the American Institute of Electrical Engineers on insulation and of the Underwriters Laboratories on rubber lined fire hose. A bibliography on standardization and a very complete index add greatly to the value and convenience of the volume for reference.

**"The Highway to Success."** C. Harold Smith. D. Appleton, New York, 1931. 160 pages. Price $1.50.

Mr. Smith, president of Binney & Smith Co., 41 E. 42nd St., New York, N. Y., in his characteristic style has written another delightful book made even more entertaining by many fascinating anecdotes. The author, a self-made man, while keenly interested in general culture, accepts the present social measure of money being the standard of success. He, however, upholds intelligence as a means of achieving it, not low cunning or wheedling. Although Mr. Smith realizes the trouble with the modern world is overproduction, he has no solution to offer to the problem. But he does give some excellent advice for those seeking the highway to success.

## New Publications

**"Air Operated Controller Equipment."** Catalog No. 4,000. The Bristol Co., Waterbury, Conn. This comprises three pamphlets relating to instruments, valves, and accessories respectively, and containing complete illustrated data on air operated equipment manufactured by the company.

**"Ulto."** The C. P. Hall Co., Akron, O. This bulletin contains a brief description of the new low temperature accelerator Ulto, suggestions for its use, and voluminous physical test data on pure gum stocks with and without stearic acid, also with Revertex.

**"Quality Products Since 1892."** The Harshaw Chemical Co., 1945 E. 97th St., Cleveland, O. This is a price list of chemicals employed in the manufacture of products in many industries among which are ceramics, foods, fireworks, disinfectants, laundry and dry cleaning, leather, metal, paint and varnish, paper, pharmaceutical, printing ink, rubber, stock food, and textiles.

**"The Market Data Book."** G. D. Crain, Jr., 537 S. Dearborn St., Chicago, Ill. A directory of industrial, trade, and class publications. This work is intended to furnish manufacturers, advertising agencies, and others interested in the development of specialized markets with the basic facts regarding those fields and the publications which serve them.

**"Calendar 1931-32."** The Miner Rubber Co., Ltd., Granby, P. Q., Canada. This calendar is unique and useful, containing interleaved colored plates of the company's goods which serve to remind the purchaser of the seasonal footwear produced for each succeeding month. The calendar begins with March, 1931, and ends with February, 1932. Following which are a few self-mailing order blanks for goods. Below the calendar hangs a pocket to receive the data sheets of goods as they are torn off to expose the monthly calendars.

**"Oak Brand Balloons."** The Oak Rubber Co., Ravenna, O. This twenty-four page catalog describes and illustrates in gay colors a wide array of many types of balloons made by the Oak company.

## Rubber Projection Screen

AN EXAMPLE of a new and rather unexpected application of rubber is in the construction of an improved projection screen.[1] A feature of the new screen is that it makes possible the observation of an image projected upon it without the appearance of distortion so commonly prevalent when the projected image is viewed at an angle to the screen other than a right angle.

The base of the screen is fabric with a coating of compounded rubber latex on both sides. Ammonia-preserved normal latex is used, to which may be added a suitable diffuser, such as casein, zinc oxide, calcium tungstate, ammonium silico fluoride, or lithium fluoride. Formaldehyde may also be added as a further preservative and for hardening.

The latex composition is applied to the fabric base by a spraying device. If a flexible screen is wanted, the base may be of some such substance as silk; while if a relatively stiff screen is desired, glass or celluloid may be used as the base. When so treated, a fabric, and in particular a silk fabric, will diffuse light passing through it and will become invisible to the eye after incorporation in a translucent screen. In other words the fabric not only becomes impregnated with the composition of the screen but remains so and does not dry out. That is, so far as its optical properties are concerned.

A pebbly surface effect is formed by spraying the latex compound on the screen base and allowing it to dry naturally. A smooth surface can be obtained by brushing the sprayed material. Thus both sides may be pebbly or smooth as desired.

A screen constructed by this method may be heavily coated for use as a reflecting screen or may be made translucent. The pebbly formation of the latex compound, even though the surface be smooth, provides means for diffusing the light coming through a screen or striking it from the front, and prevents the formation of a spot of light on the screen. The same formation also results in a lack of distortion.

The image on the screen may be viewed directly from the front or from a position such that the line of sight will form a large angle with a perpendicular to the screen, and without distortion.

[1] United States Patent No. 1,783,973, Dec. 9, 1930.

# The Rubber Industry in America

## OHIO

**The Firestone Tire & Rubber Co.,** Akron, has announced the resignation, effective March 1, of Advertising Manager Russell V. Cline, who joined the company seventeen years ago as a clerk in the advertising department and won many positions to his last post. He plans a short rest before resuming business activities. E. E. Bennett, in charge of accounting at the mechanical building, and John Keys have each completed twenty years with Firestone.

**Millard J. Hamlin** after forty-three years with the American Hard Rubber Co., Akron, last month formally retired. The occasion was marked by a banquet at which he was the honored guest and which many of his associates in the company attended. Mr. Hamlin joined the Goodrich Hard Rubber Co. in 1888 and when in 1898 the company merged with the American Hard Rubber concern, he continued with the firm.

**Anderson Rubber Co.,** Akron, through President Selden W. Anderson has announced expansion plans that include erecting a new 74 by 109 feet two-story building to be ready about June 1. The company, which in 1907 began manufacturing rubber toys, balloons, and novelties, now rents space.

**The American Floor Surfacing Rubber Products Co.,** subsidiary of the American Floor Surfacing Machine Co., both in Toledo, recently began operations with a force of fifty. The parent company will take about half the production of the rubber firm, which expects, however, to develop an independent sales force for its household rubber products and mechanical goods. C. E. Lavender is general manager.

**Standard Tire Co.** plant and property, Willoughby, idle since the death of R. G. Firestone, have been purchased by a trucking company.

**Master Tire & Rubber Co.,** controlling the Falls Rubber Co., Cuyahoga Falls, and The Giant Tire & Rubber Co., and The Cooper Corp., both of Findlay, all in Ohio, in its first annual statement announced completion of negotiations for manufacturing the Falls Roadmaster tire in England. The three factories, each being operated independently as far as sales are concerned, show a 50 per cent increase in February sales over January. On February 28 the Master company held a meeting at which the following officers were elected: I. J. Cooper, chairman of the board; R. P. Bremer, president; F. C. Milhoff, vice president; W. P. Cline, vice president and treasurer; J. F. Schaefer, secretary; and W. G. Lerch, production manager. They together with C. E Hart, R. L. Kryder, and J. B. Firestone constitute the board of directors.

C. B. Mitchella

### New Adamson General Manager

Clyde B. Mitchella, former B. F. Goodrich Co. engineer and native Akronite, recently was appointed general manager of the Adamson Machine Co. He comes to Akron from the Republic Rubber Co. of Youngstown, where he has been chief engineer for the last five years, to take over duties formerly carried on by President Russell B. Koontz.

The new general manager is well known in Akron and in the machinery field. He was educated in the Akron public schools and received his engineering education in the Case School of Applied Science.

While in Youngstown he was active in the Rotary Club. Previously he had been a leader in athletic and recreational activities at Goodrich.

The Adamson Machine Co., 730 Carroll St., now in its thirty-eighth year, manufactures rubber and paint machinery. Heavy calenders, mills, and molds used in rubber plants throughout the world are made at the Akron plant. Starting with a small shop where general machinery was made, the company grew up with the rubber industry. When the late Alexander Adamson, founder of the company, died two years ago, his plant was a $750,000 concern.

### Goodrich Activities

#### New Executive Committee

On March 9 The B. F. Goodrich Co., Akron, announced a new executive committee including three new members to take the places of four retiring members. The latter are T. G. Graham, first vice president and general manager of the tire division; T. B. Tomkinson, comptroller; V. I. Montenyohl, treasurer; and S. M. Jett, secretary. These men, however, will continue with their respective duties. President James D. Tew and Chairman of the Board D. M. Goodrich were renamed to the committee. The new members include A. H. Marks, president of the Skinner Organ Co., and former Goodrich and Diamond Rubber executive; George M. Moffett, a vice president of Corn Products Refining Co.; and C. M. Keys, president of the Curtiss Aeroplane & Motors Co. All three are Goodrich directors.

In the future the executive committee is to be maintained on this new basis of two management and three non-management men. The latter will be rotated, and next year it is expected that all or some of the new committee members will be replaced by other directors with most important positions in industries not necessarily associated with tires. The purpose of this new plan is to give Goodrich the benefit of the wide industrial experience of these capable men.

Goodrich recently reduced salaries of all employes, including officers, 10 per cent.

#### Personnel Notes

Edward Wilhelm, of the processing division, one of the oldest Goodrich employes, was honored by fifty fellow workers at an informal dinner recently. He has been with the company forty-two years. Dr. W. N. Jones, superintendent of the processing division, presented the veteran with a book autographed by members of the management and the factory staff.

A large and varied entertainment program on March 14 marked the annual Goodrich foremen's meeting. The organization includes more than 1,000 supervisory officials of the Goodrich, the Miller, and the Philadelphia plants.

#### Rubber Toys

The market for rubber toys, which usually improves in the late spring and early summer, already has demanded a substantial increase in production, according to James Taylor, sales manager of the toy department of the Miller Rubber Products Co., Inc., Akron, a Goodrich subsidiary.

"The inflated toy, or a similar principle applied to advertising matter, also has won popularity. A recent radio announcement by the Goodrich company over its 'Uncle Abe and David' hour that such a toy would be given to all persons whose requests bore postmarks within 30 hours after the announcement brought more than 250,000 letters."

In addition to the increased demand for inflated toys, the Miller company has

unusually early and indicative requests for other rubber toys, balls, bathing caps, beach accessories, and sundries.

**Goodrich Silvertown, Inc.**

Two appointments in the sales organization of Goodrich Silvertown, Inc., Goodrich retail division, were announced recently by General Manager J. P. Woodlock. J. A. Hoban, former manager of the Goodrich, Chicago zone, was made merchandising manager of Goodrich Silvertown, Inc., with headquarters in Akron. James S. Pedler, Goodrich airplane tire and accessory manufacturers' salesman in Akron and New York for two years, has been placed in charge of aeronautic sales of the retail division. All retail aeronautic sales will be handled through Silvertown stores.

In a radio address launching the nationwide Silvertown Safety League, President Tew on March 11 urged listeners-in to observe the rules of the road and to be sure all mechanical parts and tires of their cars were in perfect condition for safe operation.

Goodrich dealers will provide motorists with safety pledges, and each signer will be given a safety emblem for his radiator and a small coat button.

## Melastic Cement

FROM the Melflex Products Co., Akron, O., comes a new heavy cement, which, it is claimed "sticks everything to anything" and never becomes hard or brittle. It is, however, inflammable; so should not be used near an open flame. In applying it, spread the cement thinly with a metal scraper or brush. Then allow the solvent to dry out thoroughly, thirty minutes to one hour. Next press the cemented surfaces firmly together.

## Three New Gates Rubber Products

FROM the Gates Rubber Co., Denver, Colo., come three new rubber products designed for use on automobiles. The first, running board matting, will appeal to used car dealers, garages, and service stations whose owners are in the market to service completely all customers. The matting is jet black, with a very deep ribbed design. Exceedingly tough rubber with a burlap back insures long wear. The matting is very easy to keep clean and attractive looking; it maintains its jet black luster after being cleaned.

Gates fender flaps appear in one size for both front and rear fenders of all cars. These flaps, of heavy jet black rubber, are equipped with two small clamps to make attaching simple.

Gates Vulco windshield wiper tubing is of pure rubber stock treated to make it an exceedingly good aging stock. Although intended primarily for windshield wiper tubing, it is adapted to a variety of uses which include conducting air, gases, and liquids, and acting as an insulator for wires carrying electric current. It boasts an attractive red rubber cover, and is furnished in 25-foot lengths.

# MIDWEST

## National Association of Waste Material Dealers, Inc.

The Eighteenth Annual Convention and Banquet of the National Association of Waste Material Dealers, Inc., was held March 16, 17, and 18, 1931, at Congress Hotel, Chicago, Ill. The principal speaker at the banquet was David Friday, president of Domestic and Foreign Investors Corp., who spoke on "Outlook for Prices, Production, and Profit."

The Scrap Rubber Division met at the Congress Hotel, March 18. Louis Birkenstein acted as temporary chairman. The question of freight rates was discussed, and the chairman appointed a committee to investigate freight rates and submit some recommendations to the carriers. This committee comprising H. H. Cummings and E. B. Friedlander have the privilege of increasing its members, if advisable.

Herman Muehlstein, of H. Muehlstein & Co., Inc., was elected chairman for the coming year.

## Exhibit of Testing Machinery

The first exhibit of testing machines and apparatus will be a feature of the thirty-fourth annual meeting of the American Society for Testing Materials, to be held June 22, in the exhibition hall of The Stevens, Chicago, Ill. The exhibit will be limited to apparatus, machinery, and equipment used in testing materials. Recording and control equipment, if used in testing, may be shown, but it is not intended to include devices and machines used only in processes of production.

For further particulars address Secretary-Treasurer, American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa.

## National Drug Store Survey

The National Drug Store Survey which the United States Department of Commerce is about to undertake in St. Louis, Mo., will throw light on the conditions of profitable or unprofitable operation, not only for the stores as a whole but also in regard to the individual commodities handled.

From this survey the proprietor will learn how much the sale of rubber gloves, hot-water bottles, etc., contributes to his gross volume, what share of overhead to charge to them, and what is the real margin of profit on each article. The survey will be available in printed form through special publications of the Bureau of Foreign and Domestic Commerce, Washington, D. C.

**The B. F. Goodrich Co.,** Detroit, Mich., branch about April 1 will be moved to the Miller Rubber Products Co. branch, Goodrich subsidiary, at 2792 E. Grand Blvd. The manufacturer's division, formerly in the old branch, will then be transferred to the Fisher Building.

**Corduroy Tire Co.,** Grand Rapids, Mich., recently held its annual meeting at which the entire board of directors was unanimously re-elected. The stockholders' meeting was followed by a meeting of the board, which re-elected the following officers: president, L. A. Brown; vice president, C. S. Dickey; secretary, Mervin J. Goldner; and treasurer, B. T. Schall. The company reports an optimistic outlook for the future and hopes soon to operate its factory at capacity.

**Airlastic Rubber Co.** is the new name of the Montauk-Coronado Rubber Co., manufacturer of sponge rubber products, 3012 Clybourn Ave., Chicago, Ill. The new name was chosen as more appropriate to the business. Arnim R. Brandt is vice president and general manager.

**The United States Rubber Co.,** Tire Department, Detroit, Mich., recently broke four tire production records in one day, according to J. F. O'Shaughnessy, general manager of that department. All production records for the plant were beaten by an increase of 3 per cent; while the biggest shipment ever made from the Detroit plant was reported. More tires were cured on this day than ever before cured at the plant in a single day. All plant records for production on the new conveyer system were exceeded. With business increasing rapidly the Detroit plant of the tire department now operates three shifts daily.

Herbert F. Poehle, engineer, connected with the development division of the tire department, recently was appointed a second lieutenant in the Quartermasters' Reserve Corps, Detroit Procurement District. Col. W. Gerard Sheehan, in charge of the district, announced. This corps is charged with the procurement of supplies in case of any national emergency.

After four years with the company Walter C. Keys resigned as chief engineer of the automotive development department of the U. S. Rubber Co. to enter business for himself.

The U. S. Rubber subsidiary, Gillette Rubber Co., Eau Claire, Wis., has placed contracts for a one-story addition, 140 by 240 feet, to its three-story shipping room. Gillette recently stepped up working schedules and now operates with three eight-hour shifts and 1,028 employes.

**Monsanto Chemical Works,** St. Louis, Mo. At the annual meeting of the Monsanto Board of Directors, held at the office of the company on March 24, John W. Livingston, manager of the St. Louis works, was elected vice president. Mr. Livingston entered the employ of Monsanto Chemical Works on March 1, 1928, and was elected assistant vice president one year ago. At the same meeting, the Board of Directors elected Dr. L. P. Kyrides assistant vice president in charge of research. Dr. Kyrides has been associated with the company since Nov. 9, 1928.

# EASTERN AND SOUTHERN

**Ansbacher-Siegle Corp.,** 50 Union Square, New York, N. Y., is one of the largest manufacturers of organic and inorganic colors. The company maintains a rubber testing laboratory at Rosebank, Staten Island, where complete information as to the characteristics and the behavior of its products will be available. This laboratory will be at the disposal of those in the rubber industry.

**The United States Rubber Co.,** 1790 Broadway, New York, N. Y., will take over and operate the Stark Mills, Hogansville, Ga., a 35,000 spindle unit in the Callaway group of cotton mills. H. Gordon Smith, of New York, vice president and manager of the United States Rubber Co.'s cotton mills at Winnsboro, S. C., arrived at Hogansville to complete arrangements for bringing as rapidly as possible the production of the Stark Mills up to maximum capacity. This move will increase, by over 200 per cent, the number of employes manufacturing tire cord at the mills. Recent large increases in the sales of United States tires in addition to the acquisition of an interest in the Samson Tire & Rubber Co. and the Gillette Rubber Co. necessitated expanding the company's facilities for producing cotton cords. The capacity at Winnsboro was increased 18 per cent early in 1930, and operations there have utilized the full capacity of this new machinery ever since it was installed. Now, the addition of the Stark Mills will add another 50 per cent to the cord manufacturing capacity of the U. S. company. The Stark Mills are comparatively new and in excellent condition. The equipment is modern and complete. The houses in the mill village are of recent construction, and there is an attractive community house including a gymnasium and a swimming pool for the employes.

**The Rau Rubber Co.** has moved from 212 E. 141 St. to 506 Hunts Point Ave., Bronx, N. Y. Telephone, INtervale 9—7153.

**Pennsylvania Rubber Co.,** Jeannette, Pa., at its recent annual meeting re-elected W. O. Rutherford, president. At the same time two new vice presidents were added: W. A. Atkins, vice president and superintendent, E. C. Atkins & Co., Indianapolis, Ind.; and A. C. Bowers, Pennsylvania factory manager since 1928. The following other officers also were elected at the annual meeting: C. H. Wolfe, secretary; C. G. Morrill, treasurer; and A. D. Welty, assistant treasurer. The directorate includes the company's president, the two vice presidents, F. I. Merrick, and D. G. Sisterson.

**Charles S. Leslie,** formerly with Livingstone & Co., is now with Jno. F. Clark & Co., 27 William St., New York, N. Y., and can execute orders on all leading commodity exchanges.

**Amtorg Trading Corp.,** 19 W. 27th St., New York, N. Y., has changed its name to Amkniga Corp.

## A. S. T. M. Meetings

### Committee D-13

Committee D-13, the textile committee of the American Society for Testing Materials, held one of its seasonal meetings at the Hotel Victoria, New York, N. Y., March 12 and 13, 1931. Thursday morning and afternoon were devoted to meetings of sub-committees, and in the evening a banquet was held in the ballroom of the hotel. Friday morning was devoted to an inspection of the laboratories and the other facilities of the United States Testing Co., Inc., Hoboken, N. J. Following a luncheon provided by the testing company, a technical session was held at the Community Y. M. C. A. in Hoboken. The first paper was on testing the evenness of raw silk, by W. F. Edwards, director of laboratories, United States Testing Co.

Herbert F. Schiefer, associate physicist, Textile Section, Bureau of Standards, described an apparatus for measuring the thermal transmission of textiles and its use. He also presented a paper entitled "Relation between Twist and Certain Properties of No. 10s Cotton Yarn and of Fabrics Made from It."

### Committee D-11

Important changes in the A. S. T. M. specifications were approved for recommendation to the Society, by Committee D-11 on Rubber Products, at its meeting on March 18, 1931, at the Hotel William Penn in Pittsburgh.

The Tentative Specifications for Insulated Wire and Cable (D 27-28 T) are to be amplified by a table giving standard thickness of lead sheath and a section giving standard practice for braiding. Revisions in the chemical and physical requirements of the present specifications permit the use of organic accelerators and antioxidants in rubber insulation compounds. The Geer oven and Bierer-Davis oxygen bomb aging tests were included in the specification requirements when organic accelerators and antioxidants are used.

In the Tentative Methods of Chemical Analysis of Rubber Products (D 297-29 T) the section dealing with definition of acetone extract was revised to take into consideration the effect of the presence of organic accelerators and antioxidants. No change was necessary in the method of making the determination of acetone extract.

In the Standard Methods of Testing Rubber Products (D 15-24), it was decided to permit testing 24 hours after vulcanization and to require that, except by mutual agreement, specification tests must be performed within 60 days after vulcanization. The grade of gasoline specified in separation of rubber from cotton fabric was changed, and the time required for bringing the sample to the test temperature was shortened. The recommendation that the standard micrometer should exert a pressure on the specimen of 9 ounce plus or minus one-tenth of an ounce, was accepted to replace the former limits of 8 to 10 ounces.

Plans were completed for a Symposium on Abrasion Testing of Rubber Products to be held at the annual meeting of the Society in Chicago, June 22-26, 1931. A feature will be an open discussion of abrasion testing and related tests including those of tearing, shearing, and cutting resistance of rubber compounds. Those interested in contributing to the symposium or to the discussion are invited to communicate with Dr. H. A. Depew, New Jersey Zinc Co., Palmerton, Pa.

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**The United Carbon Co.,** with offices at 614 New York Central Building, New York, N. Y., plans to construct a series of research and control laboratories. The one at the plant at Charleston, W. Va., will be a model rubber laboratory designed to give the greatest output with the least effort.

**The Goodyear Tire & Rubber Co.** plant in Gadsden, Ala., has increased production from 5,500 to 6,500 tires a day. The company at present operates with three daily shifts of eight hours each.

**R. Y. Cook,** assistant sales manager, McClaren Rubber Co., Charlotte, N. C., on his return from a business trip to Chicago, Pittsburgh, Dallas, and Houston, declared he found business conditions better over the country, with the outlook very encouraging.

**Manville Jenckes Co.,** 40 Worth St., New York, N. Y., manufacturer of cotton goods and tire fabrics, with mills in Rhode Island and North Carolina, as a further step in its reorganization had receivers appointed to it by the Superior Court of Rhode Island, to take the place of its temporary receivers. The proceedings in the North Carolina court are not yet completed. The operation of the company's plants and those of its subsidiaries will be continued, and business will be carried on as usual.

**Charles A. Blake,** specializing in rubber goods, has opened offices at 1123 Broadway, New York, N. Y. Mr. Blake was formerly with the United States Rubber Co.

**The Vulcanized Rubber Co.,** Morrisville, Pa., recently held its annual meeting and elected the following officers: Stanley H. Renton, president and general manager; Judson Drayton, vice president, treasurer, and general sales manager; John J. Noble, secretary; David D. Smithyman, assistant treasurer and assistant secretary; Harry S. Kappler, works manager. Mr. Noble succeeds Albert G. Lingley, who retires as secretary, comptroller, and director. Hugh A. Ross has been elected comptroller, and will make his headquarters at the Morrisville factory. The board of directors is composed of Messrs. Renton, Drayton, Noble, Smithyman, and Kappler.

**William O'Neil,** president of the General Tire & Rubber Co., Akron, O., arrived recently with his wife for a short vacation in Miami, Fla.

# NEW ENGLAND

**Tyer Rubber Co.**, Andover, Mass., recently held an annual meeting at which the following officers were elected: president, S. W. Bartlett; vice president, H. G. Tyer; treasurer, W. E. Piper; clerk, G. L. Lawrence. The directorate comprises the company officers and Joseph Wiggin, George E. Abbott, and Hugh Bullock.

**Holstein Rubber Co.**, Danbury, Conn., in its production of rubber tile flooring found it necessary because of increased orders to inaugurate a midnight shift. New employes have already been taken on, and it is believed that even more will be added to the payroll. The company expects to operate to capacity throughout the remainder of the year.

**Stedfast Rubber Co.**, manufacturer of Kafsted, Suedsted, and Stafast, Mattapan, Mass., has announced the acquisition of the Clifton Mfg. Co., Jamaica Plain, Mass., now incorporated as the Clifton Mfg. Co., Inc. It will be operated as a separate company and will continue to manufacture rubber surfaced clothing, tape, gem duck, and backing cloth for the shoe trade. The officers are: W. H. Sydeman, president; J. J. Clifford, vice president; and A. Sydeman, treasurer.

**Lee Tire & Rubber Co.**, Conshohocken, Pa., has experienced such increased business in New England that it was compelled to move its New England warehouse and Boston, Mass., branch to larger quarters with better shipping facilities at 76 Brookline Ave. L. P. Niles, New England district manager, stated that Lee dealer outlets in his territory increased more than 33⅓ per cent over the previous year, and he is optimistic about future conditions.

**Massachusetts Institute of Technology** has instituted a series of authoritative lectures in which the chief executives of the nation's leading industries will be the speakers. Included among these special lecturers are Paul W. Litchfield, president of The Goodyear Tire & Rubber Co., Akron, O., and Gerard Swope, president of the General Electric Co., Schenectady, N. Y.

**Zenas Stoddard Barry,** an employe of the E. H. Clapp Rubber Co., Hanover, Mass., has completed fifty years of service with that concern. He was born in Dorchester, Mass., March 25, 1861, and entered the employ of the company on November 21, 1880. For a great many years he ran the grinding mills and then worked in the mill rooms on the sheeters. Ten years ago he became a watchman, but at present operates a night elevator. He is married and resides in Hanover with his wife and six children.

**Robert H. Montgomery** and **V. C. Carr,** of the Boston branch of The B. F. Goodrich Co., were among the company's employes who shared awards last month for creative suggestions concerning operation of Silvertown stores.

**The Arlington Rubber Co.**, Dorchester, Mass., has put on the market under the trade name "Champion" a new fifty-cent golf ball, considered better than average quality. The inner core is only ¾-inch in diameter, thus allowing for a maximum amount of pure rubber thread winding and giving greater distance and lift. The cover stock is high grade balata.

**Hood Rubber Co.**, Watertown, Mass., starting March 11 temporarily closed its gum footwear departments for two weeks and its canvas goods department for one week. Those workers who have been with the concern 25 years or more were given their summer vacation at this time, with pay; the others receive no wages. During the shutdown, plant officials worked out a program for a five-day week to go into effect immediately. These measures were made necessary by the low orders for winter footwear, resulting from the mild winter conditions.

**Black Rock Mfg. Co.**, 175 Osborne St., Bridgeport, Conn., is the sole distributer in the United States for the Morehouse abrasion testing machine, which was illustrated and described in India Rubber World, November 1, 1930, page 79.

**Quincy Rotary Club,** Quincy, Mass., on March 10 through the courtesy of the Firestone Tire & Rubber Co. in Boston, was shown motion pictures of the manufacture of tires from the raw material to the finished product, from the latex tapped from trees in Liberia to factories in the United States. John H. Querman operated the machine and explained the pictures.

**The Fisk Rubber Co.**, Chicopee Falls, Mass., has announced the resignation, effective March 1, of C. Pratt Harrington, manager of the textile division, including mills in New Bedford, Mass., Pawtucket, R. I., and Jewell City, Conn. Donald J. Brightman, formerly assistant manager, has been appointed manager. Effective March 1 also, Fisk announced a 10 per cent reduction in salaries of all executive and office employes. The company now is being operated by a stockholders' committee under receivership. At present about 1,700 persons are employed. The office personnel was considerably decreased some time ago when the company abandoned its branch retail distribution system. Starting March 23 the company changed from a four- to a five-day week to take care of the seasonal demand for tires.

## Boston Group

(*Continued from page 74*)

A. A. Glidden, shoe production manager of the consolidated Goodrich and Hood rubber companies, in an informal way enlightened the audience with his recollections of the way a rubber shoe plant was conducted in 1893 when he entered the business as a bookkeeper. The superintendent and his foremen each covered a multiplicity of duties at the most meager salary or day wages of $3.00—all testing, whether of materials or products, were made on T. S. and F. basis, meaning by taste, smell, and feel. These crude methods had qualitative value shrewdly interpreted by men of practical experience. The vulcanizing effect in compounding was secured by adding ½-pound of litharge and 1 ounce of sulphur for each pound of rubber in the batch. The following comparative cost figures were given on a pair of men's short boots:

| | 1893 Cents | 1931 Cents |
|---|---|---|
| Materials | 42.5 | 18.2 |
| Labor | 12.0 | 22.0 |
| Overhead | 3.0 | 14.0 |
| | 57.5 | 54.2 |

The list price on these goods were $3.00 in 1893 and $3.10 in 1931. The record shows that on a yearly business of $1,000,000, a profit of $150,000 to $180,000, was realized by this rubber factory in the middle '90's.

## New York Group

THE meeting of the New York Rubber Group, Rubber Division, A. C. S., was held the evening of March 11 at Cavanaugh's, an old established restaurant at 260 W. 23rd St., famed for its exceptional cuisine. On this account in addition to the papers, about 175 members and their guests attended. The entertainment program under the direction of Fred C. Batchellor, chairman of the entertainment committee, included dinner music by Albrecht's Rosedale Orchestra of seven pieces, through the courtesy of Raybestos-Manhattan, Inc. During the intermission a banjo soloist entertained the company with a medley of southern numbers. This was the first of the current year's meetings to be conducted by the new chairman, W. H. Whitcomb, who forecast a very interesting and profitable series of gatherings planned by the new executive committee.

The first paper, on the manufacture of carpets by a new process by E. K. Files and M. R. Buffington, was read by Mr. Files. The carpet referred to consists of unspun goat hair vulcanized to rubberized burlap as backing. Diagrams and views of factory equipment were exhibited to illustrate the various manufacturing processes involved and the special machine for forming and vulcanizing the product continuously. The reader is referred to a recent article in this journal[1] for a comprehensive account of the manufacture of this carpet.

The second paper, on the effect of overmilling on natural aging, was read by W. B. Wiegand, who presented data on this subject from work now in progress in the laboratories of Binney & Smith Co. From these data it appears that a tread type compound overmilled for one hour under varying conditions of temperature and openings of mill showed very serious deterioration of physical properties after a period of four years' natural aging of the vulcanized samples.

[1] "Liquid Rubber and Carpets." March 1, 1931, p. 56.

# NEW JERSEY

Rubber manufacturers in New Jersey are very much encouraged because business shows considerable improvement for some products. The majority of plants report increased orders. A few factories have even added help. Orders for garden and fire hose and belting and packing lead in production. Demand for heels and soles has greatly increased over the winter months; while the same is true of rubber cloth. The hard rubber output remains normal. Production of tires and tubes, however, has not increased to any great extent.

**The Watson-Stillman Co.,** Roselle, has purchased the assets and the business of the Burroughs Co., Newark, designer and builder of plastic molding hydraulic machinery, which includes its patented tilting head presses, rodless hubbing presses, and celluloid working machinery. The Watson-Stillman Co. will continue with these products, adding to them its own extensive line of similar equipment.

**The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.,** Passaic, reports that it has just made what it believes to be the longest single conveyer belt in the world. The belt, for a coke manufacturer, is 1,544 feet long, 36 inches wide, and, when rolled, measures about ten feet in diameter and weighs almost ten tons. As this belt was too large to fit in an ordinary box car, it had to be shipped by special truck. The company a few years ago made another belt just a few feet shorter than this one.

**New Jersey Rubber Co.,** Lambertville, announces that it may be compelled to close its plant indefinitely some time in April. The trend in the rubber industry for the past several months has been such as to make reclaimed rubber unprofitable in competition with the cheap raw material. Added to this situation is the lessened demand for rubberized cloth. The company will make up the stock on hand, then it is expected that the plant will close until business conditions become more favorable. No move, however, will be made to dismantle the Lambertville plant. The plant is owned in conjunction with other factories near Boston, Mass.

## Tire Production and Shipments

Shipments of pneumatic casings for January amounted to 3,744,349, an increase of 11.4 per cent over December although 15.0 per cent under January a year ago, according to recent statistics of the Rubber Manufacturers Association.

This organization reports pneumatic casings on hand January 31 as 8,957,307, representing a decline of less than 1 per cent under December 31, but 24.9 per cent below January 31, 1930.

Production of pneumatic casings for January is placed at 3,674,627, an increase of 30.6 per cent over the December figure of 2,814,086.

Production for January a year ago amounted to 4,486,077 casings.

W. H. Lalley

## Kelly-Springfield New Officers

Kelly-Springfield Tire Co. stockholders at their annual meeting in Jersey City, N. J., on March 10 reelected a new board of directors, retaining only four old members: Theodore G. Smith, vice president, Central Hanover Bank & Trust Co.; Stephen Peabody; Arthur Sachs, of Goldman, Sachs & Co., and John Hancock, partner in Lehman Bros., all of New York. The new directors are W. M. Flook, president, American Brown Boveri Electric Co., New York; Byron E. Hepler, vice president, Hope Engineering Co., New York; Frank Wilbur Main, Main & Co., Pittsburgh; M. B. Muxen, president, Tokheim Oil & Tank Co., Fort Wayne, Ind.; J. K. Newman, president, Newman Saunders, Inc., New York; and J. S. Patterson, president, Enameled Metals Co., Pittsburgh.

On March 18 the board elected W. H. Lalley, president of the company, to take the place of Samuel Woolner, Jr., who resigned on account of ill health. M. B. Muxen was chosen chairman of the board, J. K. Newman, chairman of the executive committee, and Louis Mueller first vice president. The new president intends to visit soon all Kelly-Springfield branches to become acquainted with their personnel. It is understood that the company plans no changes in corporate structure or any capital reorganization.

## Thermoid Notes

The Thermoid Co., Trenton, manufacturer of mechanical rubber goods, has announced that John H. Kelly has joined its staff. He started with The B. F. Goodrich Co. in 1898, then went to the Republic Rubber Co. to become its vice president in charge of sales by 1912. Later Mr. Kelly became president of the Hewitt Rubber Co.; but when it entered the Gutta Percha Rubber Mfg. Co.-Robins Conveying Belt Co. merger, he was made vice president in charge of sales. In 1928, however, ill health forced his retirement; yet since that time he has been doing special counseling work.

Thermoid has just retired Elmer E. and George H. Runyon, both of Trenton, who have been with the concern for more than forty-five years, many of which were spent as foremen. These brothers were first employed at the Trenton Rubber Co., which later became the Trenton Rubber Mfg. Co., and finally the Thermoid Rubber Co. Their associates gave the Runyon brothers a surprise party and a smoking set and lounging chair each.

F. Robert Lee, Thermoid vice president, has been spending some time in Europe, where the company has branches in the larger cities.

Since acquired by Thermoid, the Woven Steel Hose & Rubber Co. has increased production of its various goods.

**Luzerne Rubber Co.,** Trenton, announces little change in rubber production during the past month.

**Pierce-Roberts Rubber Co.,** Trenton, is very busy in the pressing department, but not in other departments.

**Frank Bernstein,** president of the Puritan Rubber Co., Trenton, is spending his annual vacation in Florida. The company reports that business has shown some improvement over last month.

**Essex Rubber Co.,** Trenton, during the past few weeks has added to its factory personnel to take care of increased orders. The company anticipates a busy spring and summer.

**Pocono Rubber Cloth Co.,** Trenton, states that business during February has been better for that month than for several seasons.

**Whitehead Bros. Rubber Co.,** Trenton, reports that business continues good, with a large increase in orders for the hose department. The warehouses are being stored with that product for the spring trade.

**Industrial Equipment Co.,** 126 S. 14th St., Newark, recently was organized to handle rubber working machinery, hydraulic equipment, and machine tools of all types and descriptions. H. M. Newman, one of the associates in the new enterprise, for many years had been connected with several organizations in the rubber working field and for the past two years was engineer for one of the larger used rubber machinery dealers in the East.

## Report Tire Stocks Promptly

The Department of Commerce will make a survey of dealers' stocks of automobile tires on April 1, 1931. Two reports will be issued; a preliminary report about April 15, and a final one at the end of April. The success of these surveys, that are invaluable to the industry, depends on the cooperation of the dealers, who are urged to report their stocks promptly on receipt of the questionnaire.

# PACIFIC COAST

A steadily improving tone is noted in the rubber trade on the Pacific Coast, and a better showing of spring business for 1931, as compared with 1930, is virtually assured. The longer than usual rainy season has almost depleted dealers' stocks of rubber footwear and clothing; livelier building operations are causing much brisker demand for mechanical rubber goods; with but slight price reductions, druggists' sundries have been selling better than a year ago; and advance orders for beach balls and various outdoor sport specialties have been much better this season than last.

The rubber lines that have been lagging notably have been those providing supplies for oil field, mining, rock, gravel, and cement plants. The restriction of crude oil production, the March drop in the price of petroleum, and the relentless price war among major companies making and marketing gasoline have greatly retarded the drilling of new wells and caused most of the larger users to be very economical in buying rubber requirements for wells, refineries, and shipping operations. Dealings in large transmission and conveyer belting have been confined of late to replacements. At some price concessions gardens and contractors' hose have been in very fair sales volume.

The tire trade, which has been marking time for many months, reports sales as steadily growing, with very good prospects. The volume would have been just as large, many dealers believe, had the recent price cut not been made. If the moderate price range had been continued, unit sales would have been just as large and would have shown a gratifying profit instead of a meager margin. The trade however, hopes that prices will remain steady, or if changed, that they will be increased. Indications are that the market is greatly undersold, and that the demand from over-thrifty buyers who have deferred purchases has reached huge proportions.

**Gates Tire & Rubber Co.**, Denver, Col., which is said to supply the major part of the rubber accessories for automobiles on the Pacific Coast, finds business steadily improving throughout the section between the Rockies and the Pacific, and considerable additions have of late been made to the large stocks carried by the company in its coast warehouses. One of the newer products for which an increasing demand is noted is sponge rubber flooring for sound-proof motion picture studios. The material is provided in 40 by 40-inch slabs 3/16 to 1-inch thick. Among the staple articles in which sales are reported as especially good are hard rubber battery cases, hose, and general mechanicals. President Charles C. Gates returned to the Coast from Honolulu March 19. The California, Oregon, Washington, and Arizona district is managed by Victor S. McNutt, with headquarters at 534 Fairbanks Ave., Oakland, Calif.

**Neversoil Rubber Products Co.**, 621 E. Ninth St., Los Angeles, Calif., plans a new enterprise on the Pacific Coast, said to be the first of its kind west of the Mississippi. The company has for years been making rubber aprons for toilet, chemical, and other industrial uses, undertakers' rubber goods and patented specialties, as well as dealing in rubber sheeting, tubing, mats, and mechanical goods, buying most of its materials in the East and Midwest. It will now do its own manufacturing in a new plant being set up at 609-13 Santa Fe Ave., Los Angeles. It is planned to have the machinery in place and operations begun not later than May 1. About 100 people will be required when the factory is in full swing. The general superintendent will be E. C. Lawhorn, for twenty-three years with Goodrich. The new plant will specialize in steam-cured rubber sheeting, pure gum and compounded tubing, mats and matting, sponge rubber tiling and upholstery, dipped surgeons' gloves, and other druggists' sundries. Dipping will be done under an improved process. General offices, warehouse facilities, and display rooms will be maintained at the Ninth St. address. Charles M. Smith is president and general manager; George H. Smith, vice president; Daisy Barr, secretary; and Samuel I. Gure, treasurer.

**Firestone Tire & Rubber Co.** (California) is stepping up tire production through increased working time and additions to the Los Angeles factory force. Sales for February are ahead of those a year ago, and March orders have shown greater increase. The outlook is very encouraging for the remainder of the year. A. J. Gibson, truck tire manager in the Salt Lake City district, has been made assistant to H. D. Tompkins, manager of truck and bus tire sales at the factory, supplanting A. Stephens, who has been appointed branch manager at Portland, Ore. The company recently opened another big one-stop service station at Bush & Franklin Sts., San Francisco, Calif., the franchise being given by Branch Manager G. McNeil to John Crowe of the Crowe Tire Co., who organized the latter in San Francisco in 1910.

**Kelly-Springfield Tire Co.** dealers from all the leading cities in the Northwest, had a sales convention recently in Portland, Ore., under the direction of Portland Branch Manager G. V. F. Harvey. The sales prospects were said to be very encouraging, and the dealers were assured by G. H. Sheldon and H. R. Hurd, of New York, and company representatives that they would be aided with an advertising appropriation in 1931 that would be double that of 1930.

**George W. Greene**, for many years factory manager for The Coast Tire & Rubber Co., Oakland, Calif., resigned March 7. Mr. Greene had previously been in charge of the Spreckels Savage Tire Co., San Diego, Calif., now dissolved.

**Tilley Mfg. Co., Inc.**, 744 Folsom St., San Francisco, Calif., Edwin Tilley, president, finds demand steadily improving for the mechanical rubber goods in which it specializes. To supply the growing trade in Southern California, the branch factory at 621 W. Washington St., Los Angeles, is being gradually enlarged, and much new machinery added.

**Willard Battery Co.**, branch of the parent Cleveland, O., concern, recently held a distributers' convention at the Los Angeles, Calif., plant, over 100 attending from Pacific Coast cities between Mexico and Alaska. Betterment of service to Willard customers was stressed, and the opinion was general that 1931 prospects are excellent.

**United States Rubber Co.** is increasing tire production at its Samson Division plant in Los Angeles, Calif., according to F. D. Carpenter, formerly factory manager of the Detroit plant and now in charge of factory operations in Los Angeles. March production was considerably above February, and the prospects are that April outturn will be much above schedule. A recent visitor at the plant was Vice President L. D. Tompkins from Detroit. S. P. Thacher is now in charge of research and development at the Los Angeles factory. Arthur S. Pond, long chemist for the Samson corporation at Compton, Calif., is now in the development department of the U. S. Rubber Co., Detroit plant. General Tire Sales Manager J. B. Magee has just returned from a long business trip up the Coast. W. W. Drum, former Samson tire sales manager, has joined the Smith & Ferris advertising firm, Los Angeles.

**Goodyear Tire & Rubber Co.** has been averaging 8,200 tires and 8,800 tubes daily at its Los Angeles plant. Since January about 200 additional workers have been taken on, bringing the payroll well up to 2,000. General Superintendent L. Tomkinson reports that sales demands are forcing steady increase in production, and peak outturn may be reached in June. The Goodyear blimp "Volunteer" is now being flown on a commercial basis, and for this purpose the airship dock adjoining the tire factory has been much enlarged. Hitherto the ship had been used for experimental work and pilot training. A few months ago it was taken to Akron, O., and its rubber-cloth gas bag enlarged to 96,000 cubic feet capacity, instead of 86,000 cubic feet, and it is inflated with helium instead of hydrogen. It also has greater cabin seating capacity. President John W. Mapel recently returned from a Northwest tour.

**Pacific Goodrich Rubber Co.**, Los Angeles, Calif., reports an increase in orders from Coast distributers, and production is being steadily advanced. R. J. Loomis was appointed San Francisco district manager; and H. S. Wheeler, aide to General Sales Manager Frank E. Titus, has been put in charge of the eighteen stores of Goodrich Silvertown, Inc. E. E. Turnbull has been transferred to the El Paso, Tex., group.

**West American Rubber Co.**, Los

Angeles, Calif., had an attractive exhibit of rotary hose, packings, pistons, etc., and a new system of sealing-off oil wells at the Oil Equipment & Engineering Exposition held in March in Los Angeles. Secretary Lamb recently returned from a business trip up the Coast. President Radford has been appointed a member of the international yachting committee for the 1932 Olympic games in Los Angeles.

**Kirkhill Rubber Co.,** 5811 S. Hoover St., Los Angeles, Calif., has installed two 48-inch mills to replace two smaller ones. The factory has been running on double time shift since January, and the outlook for increasing business is said to justify further improvements in the near future. The company makes not only many staple mechanicals but numerous patented specialties.

## Foreign Trade Circulars

*Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.*

| Number | Special Circulars |
|---|---|
| 2889 | Foreign markets and production of flooring. |
| 2891 | British exports of automobile tires and inner tubes, first nine months, 1930. |
| 2893 | Crude rubber reexports from the United States, December, 1930. |
| 2897 | Market for flooring in foreign countries. |
| 2923 | Crude rubber reexports from the United States, January, 1931. |
| 2927 | United States crude and reclaimed rubber survey, last six months, 1930. |
| 2929 | Comparative statement of numbers of pairs of canvas rubber soled footwear shipped from the United States to foreign countries during 1929 and 1930. |
| 2931 | French tire exports during December and calendar year, 1930. |
| 2932 | French footwear exports during December and calendar year, 1930. |
| 2933 | Comparative tire exports from the United States, Canada, United Kingdom, and France during the calendar year, 1930. |
| 2936 | Canadian tire exports during January, 1931. |

## Foreign Trade Information

*For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.*

| Number | Commodity | City and Country |
|---|---|---|
| ‡50,189 | Toy balloons | London, England |
| *50,221 | Advertising balloons | Mexico City, Mexico |
| †50,222 | Flooring | Zurich, Switzerland |
| *50,223 | Rubberized sheeting | Toronto, Canada |
| †50,224 | Bathing caps, balloons, toys, pharmaceutical, dental, and medical goods, reclaimed rubber, and specialties | Paris, France |
| †50,238 | Rubber goods | Kyoto, Japan |
| *50,249 | Thread | Sao Paulo, Brazil |
| ‡50,278 | Crepe rubber soles | Milan, Italy |
| †50,362 | Galoshes, hot water bottles, aprons, etc | Chemnitz, Germany |
| *†50,363 | Casings and inner tubes | Copenhagen, Denmark |
| *50,383 | Mineral rubber | Shanghai, China |
| †50,424 | Waterproof clothing | Goteborg, Sweden |
| †50,429 | Balloons | Monterey, Mexico |
| †50,433 | Printers' supplies | Yokohama, Japan |
| †50,470 | Athletic goods | Caracas, Venezuela |
| †50,483 | Belting | Toronto, Canada |
| †50,505 | Sport goods and toys | Sao Paulo, Brazil |
| †50,541 | Transmission belting | Milan, Italy |
| †50,544 | Automobile specialties | Vienna, Austria |
| †50,549 | Rubber products | La Paz, Bolivia |
| †50,639 | Belting and hose | Vienna, Austria |
| †50,640 | Toys | Rio de Janeiro, Brazil |
| *50,687 | Bands | Worthing, England |

*Purchase. †Agency. *†Purchase and agency. ‡Either.

# CANADA

*Walt Dickson, Toronto*

**Ernest C. Martin**

## General Sales Manager Canadian Dunlop Company

Few men have broader practical knowledge of the intricacies of moving products from factory and through distributing channels to consumer than has Ernest C. Martin, general sales manager of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Canada.

Mr. Martin was born in Toronto on November 8, 1887. His academic years completed and his feet set upon the path of marketing, Mr. Martin studied every angle of his chosen work. The fruits of this study are reflected in a knowledge of markets, which is international in scope and which has given him a keen sense of advertising and merchandising values.

As general sales manager of the Interlake Tissue Mills, Toronto, he gained wide knowledge of paper markets. Then in 1928 he became vice president in charge of sales for the Saranac Pulp & Paper Co., Plattsburg, N. Y., and a year later returned to his native land to take over sales direction of the Dunlop Tire & Rubber Goods, Ltd., Toronto.

Mr. Martin is a past president of the International Association of Gyro Clubs, vice president of the Canadian Export Club of Toronto, and a member of the Masonic order. His business address is 870 Queens St., East, Toronto.

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Canadian prices on rubbers are reduced approximately 10 per cent. All deliveries from manufacturers are now being billed at the new basis. The winter weather was favorable to the sale of overshoes and low rubbers, and except in certain districts good sales were made. On the other hand owing to the quietness of the lumber industry, the sale of lumbermen's rubbers has decreased, and stocks are heavier than a year ago. Among retailers in certain sections stocks of low rubbers and overshoes, also are lower than a year ago. This condition is not so much due to favorable weather as to the fact that the trade has long been buying in small lots in view of the uncertainty of the times and also the expectation, now fulfilled, that prices would be lower.

New samples of women's galoshes indicate that manufacturers are concentrating mainly on black and brown, with black strongly in the lead. In most of the sample ranges, a fancy mixture of some sort is included only to add a novel touch. The carriage boot is reported to have sold quite well, and the demand is expected to continue. The novelty rubber remains popular. One large buyer believes it is destined to take the place of the galosh. As he sees it, we are traveling in a cycle and will shortly arrive at the point from which we started, that is, with a different rubber from the old-fashioned "over," an article with a dash of style and novelty, but still a rubber, not a galosh.

**Miner Rubber Co., Ltd.,** is showing the new Miner all-rubber surface "Shu-ettes" in many styles. Concealed automatic fasteners are used on the new Miner 'Whizz Shu-ettes," for both the all-rubber and the cloth models. This firm's new "Viking Brand" heavy rubber footwear, red upper and grey sole and foxing is expected to prove popular.

**The Rockbestos Products Corp.,** New Haven, Conn., U. S. A., manufacturer of asbestos covered wires and cables, together with Canadian interests is forming a company to make Rockbestos products in Canada. Details as yet are not complete, but it is understood the factory will be located in Montreal and that Lawford Grant, president and managing director of Eugene F. Phillips Electrical Works, Ltd., will be president.

**Canadian Bicycle & Sports Goods Association** at its recent annual meeting elected D. E. Rogerson a member of the executive committee, and J. Westren an honorary officer. Both men are with the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

**Gregory Tire Co.,** Port Coquitlam, B. C., after being shut down for some months will soon reopen. While this move is expected to relieve to some extent unemployment in this locality, a small staff only will be taken on at first. Directors of the plant have asked the city council for a fixed assessment, and reopening depends partly on that decision.

**Canadian Industries, Ltd.,** Montreal, P. Q., announces that J. E. Preller, formerly sales manager of the Fabrikoid division, has been appointed division manager with headquarters at Toronto, Ont. This division is expanding its facilities at New Toronto to produce many new pyroxylin and rubber coated fabrics.

**Miss Dorothy Robb** has been appointed fashion consultant and style analyst for Canadian Goodrich Co., Ltd., Kitchener, Ont.

**C. H. Carlisle,** president and general manager of Goodyear Tire & Rubber Co., of Canada, Ltd., New Toronto, Ont., referring to the first quarter of the new year 1930-1931 told shareholders that the company maintained its relative position in the industry in total sales even though general trade conditions showed no improvement. Profits exceeded those of the same quarter in 1929. The improvement in tire and automotive industries expected by the executive for the first quarter of 1931 is being realized. It is fully expected that results for the year ending September, 1931, will be as good as those of the preceding year and possibly better. The higher duties against imported automobiles, insofar as they throw production and buying to Canada to take the place of imported cars, will help domestic manufacturers of tires and tubes. As many of the imported cars had tires of United States manufacture, greater sales of Canadian cars to replace those from the United States may help Goodyear and other Canadian tire manufacturers.

**N. M. Lynn,** sales manager of the Ames Holden McCready Rubber Co., Ltd., has become general manager of the Canadian Consolidated Felt Co., Ltd., both of Kitchener, Ont. He will fill both positions.

**Witchell-Sheill Co., of Canada, Ltd.,** manufacturer of athletic wear, formerly of Windsor, moved to Chatham.

**The Dominion Webbing Co., Ltd.,** Kingston, Ont., plans to manufacture elastic and non-elastic fabrics and webbings. About 50 looms will be installed and approximately 100 persons employed. Operations probably will start the end of April. C. M. Clinton, 21 King St. E., Toronto, Ont., for several years Canadian representative of Everlastik, Inc., will be selling agent.

**Canadian Chemists' Convention** for 1931 will be held in Montreal on May 27-29. It is hoped that many chemists and others interested in chemistry will attend.

**Northern Rubber Co., Ltd.,** Guelph, Ont., has lately given much attention to improving constructions and shapes of footwear lasts to be shown by its representatives during the spring placing season.

**G. G. Roulston** has returned to Canada to represent the Viceroy Mfg. Co., Ltd., Toronto, Ont., in western and southwestern Ontario. He spent six years in Australia, New Zealand and the Orient as Viceroy representative.

**Dominion Rubber Co., Ltd.,** Montreal, P. Q., is understood to have received from Imperial Oil, Ltd., contracts to supply it with Atlas tires for distribution at its service stations. The Dominion company recently mailed to its numerous customers in all parts of Canada important news of a merchandising plan which insures the retailer more profit on rubber footwear next season. R. H. Warwick, recently appointed Dominion footwear salesman with headquarters in Ottawa will cover eastern Ontario and the Ottawa Valley.

**Gutta Percha & Rubber, Ltd.,** Toronto, Ont., has opened a branch at 14 St. Valier St., Quebec, under the supervision of A. E. Doig, manager of the Eastern Division at Montreal. The new branch carries a full stock of rubber footwear to serve the trade in Quebec and vicinity. James Brown will take charge of the footwear department. But J. H. Larochelle & Fils, Ltd., will continue to handle the trade in Quebec and the eastern part of the province. The Gutta Percha company will take space in a new building in St. John, N. B., to replace the one formerly occupied but which was recently destroyed by fire. Members of the Gutta Percha Eastern Division staff recently gave Mr. Doig a banquet in the Blue Room of the Windsor Hotel in celebration of his silver jubilee with the company. Narcisse Gauvin was chairman. The toast to the guest of honor was proposed by Chadwick Mather, of the Toronto, Ont., office. Another guest was H. Larochelle, of Quebec, who has jobbed Gutta Percha rubbers for the past thirty-two years.

# OBITUARY

**Maurice J. Kirby**

## Fisk Sales Engineer

THE FISK RUBBER CO., Chicopee Falls, Mass., suffered an incalculable loss on March 3, when after a short illness Maurice J. Kirby, for five years its sales engineer, died at Mercy Hospital, Springfield, Mass.

Mr. Kirby was born in Springfield forty-nine years ago. He entered the employ of the Fisk company a quarter century ago in the production department. He later was transferred to the sales department and became branch and service manager. Five years ago he was made sales engineer and was recognized as one of the industry's most efficient and practical engineers.

He was immensely popular both with his business associates and his personal friends. He belonged to the Springfield Lodge of Elks, Home City Council, Knights of Columbus, and the Ludlow Country Club.

Surviving him are his widow, his father, six brothers, and five sisters.

A solemn requiem Mass, attended by Fisk employes and executives, members of the various fraternal organizations, and other friends and relatives of the deceased, was celebrated in St. Michael's Cathedral on March 6. Honorary pall bearers included Fisk officials. Burial was in St. Benedict's Cemetery.

## Herbert G. Day

HERBERT G. DAY, president of the Philadelphia Rubber Works Co., Akron, O., died March 24 after a brief illness. His obituary will be published in our forthcoming issue.

## Harris Wener

AFTER a lengthy illness Harris Wener recently passed away in his sixty-seventh year. He was a pioneer raincoat manufacturer in Canada for he established the Montreal Waterproof Clothing Co., Montreal, P. Q., in 1880.

## Arthur H. Wood

THE former receiver of the Murray Rubber Co., Trenton, N. J., Arthur H. Wood, at the age of fifty-nine died at his home in Trenton on March 8 after an illness of a year. He was president of the First National Bank, Trenton, and a member of several prominent Trenton clubs. Mr. Wood received his education at the Friends' School, Newtown, Pa. Surviving him are his wife and two sisters.

## L. H. Besson

THE vice president and secretary of the St. Joseph Lead Co., 250 Park Ave., New York, N. Y., Leonidas Huston Besson, after being ill with apoplexy for three days, died at his home, 116 E. 58th St., New York, N. Y., on March 9 at the age of sixty-one. He had been connected with the St. Joseph Company for many years and prior to that time had practiced law.

He was a member of the Sons of the American Revolution and of the Princeton Club in New York.

Surviving Mr. Besson are his widow, a son, a daughter, and a brother.

Funeral services were conducted on March 11 in the historic Trinity Church in New York. Interment was in Flower Cemetery, New Jersey.

## Airtred Rubber Flooring

A PROMINENT English manufacturer of sponge rubber, St. Albans Rubber Co., Ltd., The Camp, St. Albans, England, has designed a rubber flooring with a sponge rubber base. This floor covering is available in a wide range of colors in solid and mottled effects. Silent, soft, and hygienic, it is ideal for hospitals, cinemas, clubs, hotels, steamers offices etc. Many automobile manufacturers have found this type of flooring well suited for use in their cars. Airtred is employed also for insulating purposes and as shock absorbing material.

# The Rubber Industry in Europe

## GREAT BRITAIN

### Institution of the Rubber Industry

A meeting of the London and District Section of the Institution of the Rubber Industry was held on March 2, 1931, when three short papers were on the program: "A Survey of the Manufacture of Synthetic Resins as Applied to Molded Products," by H. Pearse; "The Influence of White Factice on the Vulcanization of Accelerated Rubber Stocks," by W. H. Bodger and H. C. Baker; and a "Note on the Influence of the Rate of Stretching in Tensile Testing," by R. Dorey. The meeting was presided over by M. P. Macfarlane.

On March 4 a meeting of the West of England and District Section was held at Trowbridge when a lantern lecture was given by B. D. Porritt on "The Early Days of the Rubber Industry."

It has been decided by the I. R. I. Council to award the Colwyn Gold Medal each year to the candidate who submits the best answers in an examination for any branch of the Associateship, provided that at least twelve candidates participate in the various Associateship examinations in that year.

In the Senior Essay competition held in 1930 and open to candidates of all ages the essays submitted did not come up to the desired standard; consequently the medal was not awarded.

The first Colwyn Gold Medal was awarded in 1928 to Professor Stafford Whitby for distinguished services to the rubber industry. The second medal went to W. H. Stevens in 1929 for the best essay sent in by candidates under 25 years of age.

### The Maxwell Scheme

The reopening of British-Dutch rubber negotiations in London has created much interest. The discussions, so far, seem to have been limited to the Maxwell restriction scheme, which has been mentioned previously in INDIA RUBBER WORLD. The scheme, while favorably received in England, was found by the Dutch to have one important drawback. The weak spot in every plan has been native rubber. Sir George Maxwell, however, thought he had overcome all difficulties regarding native rubber by providing that native outputs should not be restricted, but a 10 per cent export duty should be levied on the native product when the rubber price exceeded 6d. per pound.

The Dutch pointed out that an export duty of 5 per cent is already in force, consequently a 10 per cent duty, when the price was over 6d., would be a very small burden on the native growers and would not stop them from producing at least as much as they are producing now at 4d. per pound. One might say that they would even be encouraged to produce more than ever.

The Maxwell scheme in its present form, therefore, does not show the way out of the slump as far as the Dutch are concerned. So much time and effort have already been expended in discussions that led nowhere that a little scepticism regarding the present efforts seems to be justified. It is noted from the *Financial Times* that these latest efforts of the Dutch have been prompted by the imminent financial difficulties of a number of small Dutch rubber companies, and it may be remembered that on a former occasion it was the aloofness of the large Dutch producers that helped to put difficulties in the way of any restriction plans.

It has been suggested that the attitude of the Dutch Government with regard to the restriction of tin and sugar indicates a change of heart in connection with the restriction of rubber.

There may be something in this suggestion, but it is rather significant that Dr. Bernard, director of the Department of Agriculture, Industry, and Commerce of the Dutch East Indies, should, as has been reported, be leaving for Holland with a plan for cooperation between rubber growers and consumers which does *not* embody restriction either of output or exports. Dr. Bernard's scheme is to bring consumers and producers together with a view to joint fixing of prices. The plan, it appears, has been forwarded to the Governor General of the Dutch East Indies, and copies have been sent to Europe.

### Tire Price Reductions

A number of important tire manufacturers, including Dunlop, Michelin, Avon, Firestone, Goodyear, India, Pirelli, Trowbridge, and British Goodrich, have announced a cut in the retail prices of pneumatic tires and tubes for cars and motorcycles. The cut, effective March 2, amounts to about 7½ per cent on standard automobile, giant pneumatic, and motorcycle tires; for second grade tires the new figures are between 3 and 4 per cent lower. Heavy duty tires are not affected.

### Wage Cuts in Waterproof Trade

A new agreement has been arrived at between the Waterproof Garments Workers' Trade Union and the waterproof garments manufacturers regarding wages, the effect of which will be a reduction in the wages of machine operators and makers. During the war the system had started of giving workers a bonus in addition to the old wage instead of raising general rates, and this bonus had lately been 20 per cent. According to the new agreement, however, this bonus has been abandoned for cheaper goods; while for better class goods it has been reduced to 10 per cent. The bonus has also been entirely cut out for other machining. In addition a reduction of 1d. per garment comes off the basic rate.

Overtime will be permitted at any time in any factory on condition that workers are not employed later than 9 p.m., and that the Union may prevent overtime work when the workers in any factory are unemployed during the day.

### British Industries Fair

World depression has not lessened the interest of buyers in the British Industries Fair, the London Section of which has been transferred to Olympia. Not only were thousands of local buyers present, but a comparatively large number of buyers from abroad also attended. So that it is stated that the first day's figures are 100 per cent more than those for last year.

Among the exhibitors was the Rubber Growers' Association, which occupied a large stand, part of which was devoted to a series of rooms in the furnishing of which rubber played an important part. Attention should be called to the use of ebonite in silvered ebonite tableware and toilet articles. The sponge rubber used in upholstering furniture has been obtained by a new process and, it appears, is lighter than the ordinary type, besides being very resilient and durable.

The Avon India Rubber Co., Melksham, Wilts., displayed a large variety of sporting goods including ping-pong sheeting, bowling green mats, as well as sponge rubber numnahs (covers) for riding saddles.

The Hooley Hill Rubber & Chemical Co., Ltd., featured supersponge rubber grips for bicycles and motorcycles.

Interesting household novelties were exhibited by the New Croyden Rubber Co., London, S.E.1. They included faucet fittings of molded rubber, fly swatters, draught excluders, bottle mops, etc.

A large variety of advertising rubber mats in different colors drew attention to the stand of Redfern's Rubber Works, Ltd., Hyde, Cheshire. In the furniture section this company showed a number of household articles of rubber including floor mats which in design and coloring cleverly simulate oriental carpets.

In the Canadian Section representatives of the Miner Rubber Co. exhibited heavy rubber boots for fishing and agriculture, a wide range of women's shoes in red, blue, and green besides the conventional tan and black; also red, blue, and green Wellingtons for juniors.

The agents of the Columbus Rubber Co., Montreal, Ltd., showed the heavy footwear

specialties which included a lumberman's boot extending to the ankle, of medium weight and a reasonable price. This short boot immediately became popular in England among those who dislike heavy, clumsy footwear.

Sporting goods of every kind, a large variety of balls, machinery, rubber chemicals, etc., were also displayed by several well-known rubber companies.

### Geo. Hankin & Co.

On February 28, 1931, Alfred C. F. J. Westendarp retired from Geo. Hankin & Co., 21 Mincing Lane, London, E.C. 3. That same day his son, H. E. A. Westendarp, long connected with the rubber trade, was admitted as a partner by the Hankin firm.

### Storage Battery Separators

The Britannia Batteries, Ltd., London, W.C. 2, has acquired the rights to manufacture in Great Britain, Northern Ireland, and the Irish Free State rubber microporous separators for use in storage batteries, according to a process developed by Dr. H. Beckmann, of the Accumulatoren Fabrik A.G., Berlin, Germany, and is already producing this separator at its works at Redditch.

The "Mipor" separators, as they are called, are made from latex to which sulphur has been added and from which a gel is obtained. The gel is vulcanized in water or saturated steam to prevent the watery liquid combined with the rubber globules in the gel from being expelled during the process. After vulcanization is complete, the skeleton of the substance produced is so firmly built up that the water, which served to support the gel, is no longer necessary and can be removed by evaporation. By this evaporation countless microscopic pores are formed which uniformly permeate the whole structure. The number and the size of the pores appear to depend on the amount of water originally in the gel so that within certain limits it is possible to vary the porosity of the product.

Laboratory tests and measurements, it is claimed, have proved that the electric resistance of the "Mipor" separators is remarkably low, only about half that of a wood separator of similar size and thickness. The outstanding advantage of the new separator is said to be that it will withstand, to a remarkable degree, the chemical action and the highest temperatures met with in storage battery practice. Temperatures above 140°F., however, are injurious to the accumulator plates and should therefore be avoided.

## ITALY

The Walter Martiny Company, Turin, Italy, which has absorbed the following companies: Bergougnan Italiana, Piemontese Industria Gomma Affini, and Lavorazione Italiana Filo Elastico, has raised its capital from 6,000,000 to 27,000,000 lire. In addition it is issuing obligations to a value of 10,000,000 lire. The new organization is to be known as Fabbriche Riunite Industria Gomma.

## GERMANY

### Imports and Exports

The figures concerning Germany's imports and exports of crude and manufactured rubber during 1930 have just been published and indicate an all-round decline in Germany's rubber business for the year; thus imports of crude rubber were 514,220 quintals, value 69,904,000 marks, for the year 1930 against 530,953 quintals, value 102,461,000 marks, in 1929, or deducting reexports, 462,195 quintals, value 62,474,000 marks, instead of 498,661 quintals, value 91,161,000 marks. The imports of manufactures of rubber decreased from 77,296 quintals, value 38,850,000 marks, to 68,960 quintals value 34,582,000 marks; and the exports of rubber goods, from 227,990 quintals, value 131,679,000 marks, to 218,637 quintals, value 114,317,000 marks.

Among the imports of other raw materials or partly finished materials, gutta percha and balata are practically unchanged; the 1930 figures are 2,090 and 6,477 quintals respectively; but arrivals of waste decreased from 51,519 to 34,091 quintals; rubber substitutes, 139 instead of 242 quintals; rubber dough, reclaim, unvulcanized rubber with wire insert, etc., 7,314 instead of 12,107 quintals; and unvulcanized cut sheet, 216 instead of 374 quintals.

Imports of tires and tubes for motor vehicles, and tubes for bicycles and other vehicles dropped sharply.

In the case of tubes for motor vehicles the drop was from 257,917 to 181,968 quintals. Shipments from the United States show the severest decline, 41,903 against 81,177, or a drop of nearly 50 per cent; Belgium, which in 1929 sent 81,270, was nearly as bad with 47,300; France's share dropped from 46,500 to 31,649; but England gained 18,717 against 16,704 quintals. It may be worth noting that Soviet Russia was among the exporters of automobile tubes to Germany, shipping 6,890 quintals; while Czechoslovakia appears with 2,618.

Covers for automobile tires declined from 333,675 to 299,727. The largest supplier was the United States, which, however, dropped from 138,106 to 102,113; Belgium, which came next, also noted a decrease, from 88,020 to 76,899; as did Italy from 53,707 to 45,596; and France from 22,169 to 17,496. On the other hand, as in the case of tubes, England's shipments gained, from 13,283 to 24,290; also Austria's, from 6,716 to 20,806; and Soviet Russia's, from 6,692 to 9,966.

While bicycle tubes, half of which came from Belgium and slightly less than half from France, shared in the general decline of imports, 172,550 against 211,930, imports of cycle covers showed a small increase, from 305,246 to 315,585. Shipments from Belgium and France remained practically stationary at 150,988 and 116,575, respectively, but those from Italy increased from 26,042 to 33,577.

The imports of footwear were 718,982 pairs during 1930; totals for 1929 are not available. The United States was the chief source for these goods, supplying 157,558 pairs; it was closely followed by Sweden with 142,690 pairs, and Soviet Russia with 131,554 pairs.

The greater part of the belting hose and packing imported by Germany comes from the United States, which supplied 416 out of a total of 974 quintals in 1930, (against 489 out of a total of 1,164 quintals), 206 quintals of hose out of a total of 460 quintals, and 473 quintals of packing out of 588 quintals.

Among the exports were automobile tubes, 244,694 instead of 250,762; covers, including leather, 302,122 instead of 301,339; tubes for bicycles, 2,334,874 instead of 2,299,877; covers for bicycles, 893,765 against 1,001,961; footwear, 1,716,882 pairs, almost half of these went to Great Britain; belting 5,579 quintals against 5,467 quintals; hose, 20,432 instead of 20,005 quintals; packing, 3,194 instead of 3,723 quintals; elastic goods, 19,532 instead of 19,811 quintals; and hard rubber and hard rubber goods, 11,428 instead of 12,891 quintals.

### International Auto Show

At the International Automobile Show, held in Berlin from February 19 to March 1, 1931, it was noted that in Germany also the use of rubber in the construction of automobiles is increasing rapidly. The use of the Silent Bloc is fairly widespread. Cars use rubber vulcanized to the steps; in the Adler car the steps have raised rubber strips, which can be changed when worn. As to tires, giant pneumatics are gaining headway; manufacturers are campaigning for oversize tires, while Continental is introducing the universal tire that can be used both as high pressure and low pressure tire as required. The Phoenix company is said to be the only German firm producing large airplane tires with the dimensions 1,500 by 350 mm.

The exhibitors of tires at the show included Continental, the firms that now form part of this organization: Continental Caoutchouc Compagnie G.m.b.H., Peters Union, Excelsior, Polack-Titan, and Liga. As was to be expected the concern made a very fine showing and occupied by far the largest stand. Other German tire manufacturers represented at the show were: Deka Pneumatik, Berlin O. 112; Deutsche Dunlop Gummi Co., A.G., Hanau a. M.; Harburger Gummiwarenfabrik Phoenix A. G.; Harburg-Wilhelmsburg; Seiberling-Fulda G.m.b.H.; Fulda; Vorwerk & Sohn, Barmen. The foreign tire industry was represented only by the India Tire & Rubber Co., Ltd., Inchinnen, Scotland, and the United States Rubber Co., the latter through its German agents, Ekert & Co., Hamburg.

### Sandblast Hose

The sandblast hose has found an increasing number of uses in recent years according to *Gummi-Zeitung*. Hose with different diameters are required for the various purposes to which the device is put. Thus in iron foundries it is customary to use large hose, from 40 to 60 mm. diameter; in metal foundries smaller diameters, from 19 to 32 mm. are needed for the same purpose. The smaller diameters, from 25, 28, and 32 mm. also serve for engraving and

(*Continued on page 98*)

# The Rubber Industry in the Far East

## NETHERLANDS EAST INDIES

### Rubber Industry Remedies

Rubber planters are becoming convinced that the best way out of their plight is to find new uses for rubber and to extend old ones, rather than restrict production. The next step they envisage is the conversion of rubber into goods right on the spot. During the previous slump several planters tried this scheme on a small scale, of course. The result of their efforts was crepe soles, which became popular.

A recent issue of the *Algemeen Landbouwweekblad* discusses this subject. The writer believes that the remedy for the present condition in the industry is decreased production costs and increased cooperation among producers. The first is to be attained by reducing the inflated home directorates and luxurious, overstaffed offices, by making local managers more independent and giving them more responsibility, and finally by cutting salaries of the eastern executives to a level that will permit them comforts but not the luxuries.

*Dr. J. Stroomberg, Chief, Division of Commerce, Department of Agriculture, Industry, and Commerce, Buitenzorg, Java.*

**Tapping Rubber near Soekaboemi, West Java**

As to the second point, at present too little cooperation exists between producers in the various countries. This lack could be remedied by forming a committee of three leading men from each country to appoint its officers from the members, each estate to contribute toward the expenses of the members chosen. The committee would first have to fix the various standard qualities of rubber so that the producers will no longer be at the mercy of the buyers. Then the committee would issue £1,000,000 in bonds carrying 5 per cent interest, to which all producers, excluding those who are also manufacturers, would have to subscribe. These bonds would not be disposable without the committee's knowledge.

With the money so raised a big factory would be established in Sumatra, Java, or Singapore, to make all kinds of goods from crude rubber supplied by the bond holders, who would share the profits. A well-equipped laboratory would be connected with the factory to experiment in making rubber suitable for new uses, as roads, roofing, etc.

The plan, we note, takes care of profits, but nothing is said of losses.

### Danger of Red-Root Mold

It is well known that young trees are frequently attacked by white root mold. But after the trees are treated, the symptoms gradually diminish to disappear entirely as the trees grow older.

Red root mold, on the other hand, is regarded as a disease affecting old trees and has been found to take as long as ten years, if not more, for the mold to kill an old tree.

If, however, an old rubber section, harboring cases of this disease, is cut down and replanted after incomplete clearing, or if a plantation is started in a jungle clearing where remains of infected trees have unwittingly been left in the soil, the results may rapidly prove fatal to the young plantation.

A writer in the *Bergcultures* states that in a certain infected area it was found that 4½-year-old trees had been killed by this mold. In another, more striking instance some buddings had been made in a small field adjacent to the oldest section of the plantation. An old tree, fifteen feet away from the buddings, had previously been isolated by digging a deep pit around it because it had developed the disease of red root mold.

As the clone from which the buddings had been made proved to be inferior, the buddings, then one year old, were left to themselves. Three and a half years later some trees were found dead. The matter was ignored until a few months later when a number of trees, felled by a storm, were infected with red root mold. Inspection of 87 trees still standing revealed that 23 trees were dead, with only the remains of roots in the ground; 20 trees were badly infected and 9 slightly; while 35 were quite healthy. It is noteworthy that the latter were farthest from the isolated tree, and the dead trees nearest.

The trees in this instance happened to be very closely planted. The writer, nevertheless warns planters in replanting to go over the ground very carefully to remove every bit of root and, if needed, to disinfect the soil chemically, no matter how high the costs, if the risk of being faced with a plantation doomed to die just when it is ready for tapping, is to be avoided.

### Improving Plantations

Budding in the field, says an article in the *Bergcultures*, is the quickest method of obtaining high producing areas where estates have sections of young rubber planted from unselected or indifferently selected seed. Experience has shown that if performed with care by skillful workers, budding of seedlings from 1 to 4 years old in the field gives satisfactory results. The writer states that budding of 5 to 8-year-old trees is unknown to him, but such budding should be possible if the necessary care is taken. As a matter of curiosity, mention is made of a successful budding of a backward 10-year-old tree. The advantage of the system is that buddings grown on older stock with a well-developed root system grow much more rapidly and, therefore, reach the tapping stage earlier than buddings made in the nursery.

### Singapore Rubber Works, Ltd.

The Singapore Rubber Works, Ltd., Singapore, has announced the acquisition from the Netherlands Gutta-Percha Co. of the factory of rubber goods known as Singapore Rubber Works. The products of this plant will continue as before under the name of Singapore Rubber Works, Ltd.

## CEYLON

### Budding in the Field

T. H. Holland, manager of the Experiment Station, Peradeniya, discusses hevea budding in the field in a recent issue of *Tropical Agriculturist*.

Mr. Holland refers to the findings of C. E. T. Mann published in the *Journal of the Rubber Research Institute of Malaya*. The largest number of budding successes was in the group of stocks which were in a state of vigorous growth both at budding and at the time of opening the bandage; while the lowest percentage was obtained in the group of stocks dormant at both these times. Also results from

budding in showery weather and in drought condition indicated that the successes were greater when budding had been done during showery weather.

Mr. Holland found as a result of budding 17 Ceylon clones in the fields that there was no apparent advantage in the stock being in an active state of growth at the time of budding. Nor was there any advantage in building on dull days instead of hot sunny days. In fact the highest percentages of successes were obtained on hot sunny days. No budding was done under drought conditions, but from an examination of the rainfall 5 days before and 10 days after budding it appeared that a higher percentage of successes was obtained in the periods of lesser rainfall.

Considerable differences in the number of successes were recorded for the different clones, and it is believed that the two most important factors influencing results are the individual suitability of a mother tree for successful budding and the state of the budwood used.

The statement that when a bud has failed, there is little chance of success by rebudding it on the other side until 4 months has elapsed may be true for small stocks, but not so with 2-year-old stocks. Here the original stocks were rebudded on the other side when a failure was recorded; the rebudding in all cases took place within two months of the original budding. The average percentage of successes obtained here was actually higher than at the original budding while conditions were practically the same. From this fact it is concluded that rebudding large stocks again on the other side without delay is well worth while.

Finally, much better results were obtained by budding on vigorous 1-year-old stocks in the nursery than on stocks 2 years old or more, in the field.

## Preparing Plantation Rubber

The superintendent chemist in London of the Ceylon Rubber Research Scheme has published an interesting report on the various methods of preparing plantation rubber in Ceylon, Malaya, and Java.

Ceylon is more hilly than Malaya or Java, making agricultural operations and latex collecting more difficult. In Java conditions appear to be the least difficult. The climate of Ceylon is less advantageous than in Malaya and Java, the temperature is about 5° lower than in the other centers named. This lower temperature retards fermentation in Ceylon, while it further affects tree growth and the rate of bark renewal. For these reasons it is customary to take much thinner shavings during tapping than elsewhere to allow for the slower bark renewal.

Although the rainfall is abundant in all three countries, humidity is lower in Ceylon so that rubber can be dried there in less than a week when the weather is favorable; whereas in Malaya great care is necessary with regard to position, dimensions and ventilation of the drying room.

In Java artificially heated drying sheds are used for crepe rubber in order to be

(*Continued on page* 115)

# MALAYA

## Low Price Production

The *Straits Budget* publishes a provocative article on the prospects of the rubber industry, by A. L. Fairbank, who visited Malaya and the Dutch East Indies, and was impressed by "the hopeless outlook of achieving anything by restriction."

After surveying the present world-wide depression, Mr. Fairbank asks whether it is correct to assume that the world is rapidly recovering and that there will be better times in the near future; and whether we should instead, take comfort in that business is now at its worst and, therefore, ought to mend. But when? Apparently not in 1931; for this year is likely to prove one of cautious trading on all hands. The potential production of crude rubber in the East is at present about 1,250,000 tons, but we do not know whether the world will require even 700,000 tons, which some estimate may be the 1931 output.

Rubber's chief use is bound up with transport, which is fortunate, says Mr. Fairbank, because a world-wide recovery of trade is more likely to occur in renewed transport activity than in any other direction. A large tire replacement business is, therefore, in prospect but if this business shows itself this year, it is not likely to affect the price of crude rubber seriously because there are still enormous stocks of rubber to be taken up. But, considering the cause of the decline in 1930 trade and the serious set back to prosperity, it is not likely that the world will use much more rubber for tires in 1931 than it did in 1930, even if we make allowance for a certain amount of replacement business in the latter half of the year.

Apparently, then, no reason exists to expect that a renewed demand for tires in 1931 will cause increase in price.

But the price of rubber is influenced not only by the tire demand; there is also the factor of outside speculation to be considered. In view of the nerve-shaking experiences of the past few months, Mr. Fairbank thinks the bait to catch the speculator must be very attractive, and he does not believe that the speculator will risk any further his already depleted sources.

Because of all this and the fact that cost of production has been enormously lowered and may undergo further reduction, factories will not be likely to develop a bold buying movement; consequently prices will fluctuate within very narrow limits for a good time to come.

Now, as to the rubber planter. The problem confronting him in 1931 is how much rubber to produce to give factories what they require and allow the excess world stocks to be absorbed at the same time; and how is he going to solve it?

The obvious answer is to cut down supply. But Mr. Fairbank is not in favor of restriction; for it may relieve conditions for a time. But when the price is raised, the old trouble is sure to start again. Furthermore so long as the tire industry is the main outlet for the commodity, the producing world for a few years to come is likely to put more rubber on the market than the world can use. Only one real remedy exists, and that is the development of new uses for rubber, rubber floors and roads.

"With the prospect of a low price," says Mr. Fairbank, "if it could only be assured for a long time, the extension of the use of rubber comes very largely into the picture, and the evil prospect of enforced idleness on the estates might diminish..... Are we acting with intelligence and foresight in accepting the doctrine that it is better to produce less at an increased price than the full quota at a lower? Would it not be wiser to consider a policy which raised the world consuming capacity to a level approximating far more closely to the potential production figure? The time is not ripe to suggest all out tapping, but surely this must be the objective.

"To sum up, it is suggested that it would pay better to produce the full quota at a very low price and thus give every encouragement to the consumers to expand the use of rubber and to avoid crippling this objective by constant talk of restriction of supply with the view of raising the price level."

## Bark Reserves

It is usually assumed that the system of multilation which the small holder calls tapping, leads to a depletion of bark reserves, poor bark renewal, increase in disease and a general lowering of the vitality of the trees.

But the case is not so simple says the *Malayan Agricultural Journal.* If it were, Malaya would today have a very large area of useless small holdings, but the fact is that the yields from these holdings continue to increase.

To be sure the low price for rubber forces the small holder to tap to capacity, but it is doubtful whether the system is more harmful than that prevailing in prosperous times when lessees of small holdings tried to get the highest yields possible.

Besides this practice the small holder having planted a large number of trees on a small area taps the best trees; so a large number of trees are always resting.

While large estates still to a great extent, adopt the policy of clean-weeding, which reduces soil fertility because of erosion and loss of humus, small holders neglect weeding and so have retained the soil; and this is still further assisted by the large stand of trees. While in practice the small holder removes about 2 inches of bark in the same time that estates remove 1 inch, the average removed a month by the small holder does not differ greatly from that on estates because of the large number of trees always resting.

The subject of bark reserves has been raised by the Rubber Growers' Association and was considered at the Second Interdepartmental Agricultural Conference held at Kualar Lumpur last October. The problem of devising a satisfactory system for regularly obtaining information on bark reserves was discussed at some length and resulted in the appointment of a committee to consider the question further.

# Patents, Trade Marks, and Designs

## Machinery

### United States

1,789,822.* **Extensible Strip Material.** This machine comprises conveyers arranged in series of two longitudinally alined units, wherein the second is adapted to receive material from the first unit and to convey it at a greater speed. C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,789,892.* **Centering Spheres.** A sphere such as a golf ball is supported and quickly and accurately lined up on a predetermined circumference with a printing or marking die. T. and M. Allatt, both of Summit, N. J.

1,790,010.* **Immersing Airbags.** This device provides for dipping airbags into a liquid mixture of latex and mica to prolong the life of the bag and simplify its removal from the casing. G. H. Lewis, assignor to Fisk Rubber Co., both of Chicopee Falls, Mass.

1,790,233.* **Embossing Machine.** This relates to a method and apparatus for embossing footwear with brands and coloring them with rubber cement in the same operation. F. D. Fowler, Newton, Mass., assignor to Hood Rubber Co., Inc., Wilmington, Del.

1,791,096.* **Sorting Apparatus.** This is developed for sorting tennis balls, and is applicable wherever articles are to be sorted by weight. W. E. Humphrey, assignor to Pennsylvania Rubber Co., both of Jeannette, Pa.

*Pictured in group illustration.

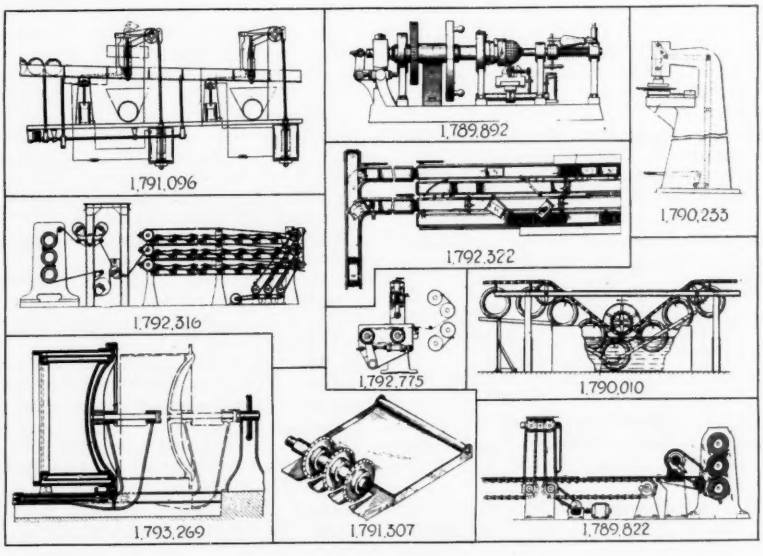
1,791,307.* **Tire Fabric Slitter.** This invention provides means for slitting rubber frictioned, bias-cut woven fabrics and at the same time clears the severed fabric edges from the cutting knife as soon as the cut has been made. J. O. Goodwin, Akron, assignor to Seiberling Rubber Co., Barberton, both in O.

1,792,316.* **Tube Stock Conveyer.** This is of value in manufacturing inner tubes from a continuous strip of unvulcanized rubber composition as it is delivered warm from the calender. The apparatus supports the strip of stock to avoid deforming strains and feeds it longitudinally in a way to permit a desirable amount of shrinkage. C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,792,322.* **Footwear Conveyer System.** This is designed to keep rubber footwear workers supplied with stock pieces and without confusion. The apparatus provides economy of labor, power, and floor space, avoids waste of material, and facilitates inspection of the work. C. M. Richardson, Akron, and A. J. Howe, Cuyahoga Falls, both in Ohio, assignors to B. F. Goodrich Co., New York, N. Y.

1,792,775.* **Unit Tire Builder.** This provides a number of special units, each used for the application of a particular element of the tire construction. A considerable saving in equipment and a great increase in workmen's efficiency is effected. R. W. Snyder, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,793,269.* **Vulcanizing Apparatus.** This device vulcanizes sheet rubber in long lengths or strips. It is economical of heat, is easily and rapidly operated, and deals efficiently with long lengths of material. H. Willshaw, Wylde Green, and W. G. Gorham, assignors to Dunlop Rubber Co., Ltd., both of Birmingham, all in England.




17,934 and 17,935 (Reissues). **Elastic Fabric Mechanism.** J. V. Moore, assignor to Moore Fabric Co., both of Pawtucket, R. I.

1,789,358. **Coil Winding Machine Tester.** C. H. Franks, La Grange, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,789,457. **Extruding Machine.** J. E. Boynton, Oak Park, Ill., assignor to Western Electric Co., Inc., New York, N. Y.

1,789,858. **Tire Builder.** G. Bäckdahl, Djursholm, Sweden.

1,789,881 and 1,789,882. **Insulated Wire Machine.** B. H. Reeves, assignor to Rockbestos Products Corp., both of New Haven, Conn.

1,790,011. **Vulcanizing Mandrel.** M. A. Marquette, assignor to Fisk Rubber Co., both of Chicopee Falls, Mass.

1,790,114. **Steam Platen.** F. G. Schranz, assignor to Southwark Foundry & Machine Co., both of Philadelphia, Pa.

1,790,210. **Tire Apparatus.** J. R. Gammeter, Akron, O.

1,790,354. **Tube End Buffer.** G. B. Nichols, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,790,755. **Hose Basket.** J. T. Lally, Wilmington, Del.

1,790,875. **Stock Treating Device.** H. L. Moran, Cleveland, O.

1,790,949. **Tire Inspection Machine.** H. B. Sabin, Cleveland, O.

1,791,055. **Hose Press.** R. W. Dinzl, Bywood, assignor to Southwark Foundry & Machine Co., Philadelphia, both in Pa.

1,791,060. **Inner Tube Apparatus.** A. W. Keen, New York, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,791,102. **Reclaiming Apparatus.** F. J. McDevitt, St. Louis, Mo.

1,792,298. **Vulcanizing Rubber to Metal.** C. H. Gray, London, England.

1,792,462. **Tire Building Drum.** C. B. Hudson, assignor to Akron Standard Mold Co., both of Akron, O.

1,792,702. **Hollow Article Device.** U. Pestalozza, assignor to Sociétá Italiana Pirelli, both of Milan, Italy.

1,792,776. **Tire Builder.** R. W. Snyder, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,792,778. **Tire Builder.** W. C. State, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,792,813. **Tube Machine.** W. H. Camp-

bell, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,793,257. **Tire Builder.** A. J. Slatter, assignor to Dunlop Tire & Rubber Corp., both of Buffalo, N. Y.

### Dominion of Canada

308,121. **Tire Apparatus.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.

308,360. **Mold Breaker and Transporter.** Goodyear Tire & Rubber Co., assignee of M. C. Nelson, both of Akron, O., U. S. A.

308,363. **Conduit Manufacture.** Goodyear Tire & Rubber Co., assignee of E. C. Kastner, both of Akron, O., U. S. A.

308,536. **Tire Shaper.** Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont., assignee of G. B. Nichols, Akron, O., U. S. A.

308,538. **Calender.** Gillette Rubber Co., assignee of H. O. Hutchens and A. R. Krause, all of Eau Claire, Wis., U. S. A.

308,714. **Inner Tube Apparatus.** Firestone Tire & Rubber Co. of Canada, Hamilton, Ont., assignee of G. B. Nichols, Akron, and W. B. Earley, Cuyahoga Falls, both in O., U. S. A.

### United Kingdom

338,114. **Battery Box Mold.** J. Ferguson & Sons, Ltd., and J. E. Ferguson, both of London.

338,389. **Pulping Engine.** Intercontinental Rubber Co., assignee of G. H. Carnahan, both of New York, N. Y., U. S. A.

339,463. **Vulcanizer Vapor Heating System.** Firestone Tire & Rubber Co., Ltd., Middlesex. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

### Germany

518,346. **Roughening or Polishing Device.** A. Aue, Grasdorf, Leine.

518,557. **Latex Mold.** K. D. P., Ltd., London, England. Represented by F. Cochlovius, Frankfurt a. M.

519,936. **Belting Connector.** Continental Gummiwerke A. G., Hannover.

519,944. **Splitting Felloes.** Goodyear Tire & Rubber Co., Akron, O., U. S. A. Represented by G. Loubier, F. Harmsen, E. Meissner, and F. Vollmer, all of Berlin S. W. 61.

#### Designs

1,156,938. **Zipper Fastenings.** Waldes & Co., Prag-Vrsovice, Czechloslovakia. Represented by L. Schiff, Berlin.

### France

694,251. **Hydraulic Press.** Niederrheinische Maschinenfabrik Becker et Van Hullen A. G.

694,353. **Making Washers.** H. Weil.

694,414. **Tire Mold.** E. Moulin.

695,337. **Tire Repair.** G. L. E. J. Mouton.

695,764. **Collapsible Mandrel.** Anode Rubber Co.

695,789. **Hydraulic Accumulator.** Hydraulik G. m. b. H.

696,028. **Rerubbering Tires.** J. M. Piquera.

696,697. **Bead Fixing Device.** Dunlop Rubber Co., Ltd.

## Process

### United States

1,790,118. **Bathing Cap.** J. Stein, New York, N. Y.

1,791,208. **Battery Plate.** A. S. Hubbard, Bethel, Conn., assignor, by mesne assignments, to Gould Storage Battery Corp., Depew, N. Y.

1,791,810. **Fluid Tight Joint.** E. C. Furman, Newport News, Va.

1,792,187. **Water Dispersed Dipped Goods.** I. W. Robertson, assignor to Thermo Process Co., both of Akron, O.

1,792,362. **Ball.** M. J. De France, assignor to Pennsylvania Rubber Co., both of Jeannette, Pa.

1,793,075. **Gasproof Fabric.** J. B. Flowers, Brooklawn, N. J.

### Dominion of Canada

308,261. **Inflatable Goods.** J. H. Johnson, Toronto, Ont.

### United Kingdom

338,215. **Electric Cable.** W. W. Richardson, London.

338,766. **Purifying Latex.** K. D. P., Ltd., London.

338,789. **Attaching Rubber to Leather.** K. Ehmke, Hamburg, Germany.

339,303. **Vulcanizing under Gas Pressure.** Industrial Process Corp., Albany, N. Y., U. S. A.

339,320. **Hollow-Ware Manufacture.** P. Pick, New York, N. Y., U. S. A.

339,517. **Cycle Saddle.** H. and J. Jelley, and Flexible Saddles, Ltd., all of Birmingham.

339,676. **Thread.** Dunlop Rubber Co., Ltd., London, W. G. Gorham and E. A. Murphy, both of Fort Dunlop, Birmingham.

### Germany

518,134. **Stamps.** (Addition to patent 419,915). H. Endler and O. Hildebrandt, both of Berlin N. 31.

### France

693,701. **Ebonite Diaphragms.** M. Wildermann.

693,729. **Rubber Soled Shoes.** J. Frassin.

693,988. **Undergarments.** M. Descomps.

694,676. **Rubber Articles.** Dunlop Rubber Co., Ltd., and Anode Rubber Co., Ltd.

694,746. **Preventing Sheets from Adhering.** G. Uhl.

694,768. **Rubber Articles.** Dunlop Rubber Co., Ltd., and Anode Rubber Co., Ltd.

695,116. **Footwear.** H. C. L. Dunker.

695,691. **Tires.** Societe Michelin & Co.

695,837. **Crepe Soled Shoes.** P. Lanes.

696,176. **Articles from Dispersions.** Dunlop Rubber Co., Ltd., and Anode Rubber Co., Ltd.

697,303. **Fixing Tires on Wheels.** C. J. Simeon and F. G. Eissaurat.

697,712. **Crepe Soled Shoes.** P. Lanes.

697,762. **Rubber Articles.** Dunlop Rubber Co., Ltd., and Anode Rubber Co., Ltd.

697,888. **Repairing Punctures.** A. Dirner, D. Stollmann, and E. Toperczer.

## Chemical

### United States

1,789,696 and 1,790,794. **Age-Resister.** W. S. Calcott and W. A. Douglass, both of Penns Grove, N. J., assignors to E. I. duPont de Nemours & Co., Wilmington, Del.

1,791,009. **Polymerized Vinyl Chloride.** I. Ostromislensky, New York, assignor to L. A. Van Dyk, Yonkers, both in N. Y.

1,791,876. **Accelerator.** A. A. Somerville, Flushing, assignor to R. T. Vanderbilt Co., New York, both in N. Y.

1,792,041. **Accelerator.** W. Scott, assignor to Rubber Service Laboratories Co., both of Akron, O.

1,792,042. **Age-Resister.** W. Scott, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,792,096. **Accelerator Manufacture.** W. P. ter Hoist, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,792,277. **Colored Coated Fabric.** J. J. Clifford, Reading, assignor, by mesne assignments, to Steadfast Rubber Co., Inc., Mattapan, Boston, both in Mass.

1,792,770. **Accelerator.** L. B. Sebrell, Akron, O., and D. N. Shaw, Philadelphia, Pa., assignors to Goodyear Tire & Rubber Co., Akron, O.

1,792,780. **Accelerator.** J. Teppema, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,792,819. **Accelerator.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,793,161. **Compounding Ingredient.** A. B. Cowdery, Needham, Mass., and T. A. Bulifant, Maywood, N. J., assignors to Barrett Co., New York, N. Y.

1,793,265. **Latex Compositions.** D. F. Twiss and E. A. Murphy, assignors to Dunlop Rubber Co., Ltd., all of Birmingham, England.

### Dominion of Canada

308,096. **Insulating Material.** Calicel Products, Inc., Chicago, Ill., assignee of W. T. Dean, Hammond, Ind., both in the U. S. A.

308,110. **Coating Composition.** Canadian Industries, Ltd., Montreal, P. Q., assignee of C. M. A. Stine, Wilmington, Del., and J. E. Booge, Newark, N. J., both in the U. S. A.

308,111. **Coating Composition.** Canadian Industries, Ltd., Montreal, P. Q., assignee of C. M. A. Stine and C. Coolidge, both of Wilmington, Del., and E. B. Middleton, New Brunswick, N. J., all in the U. S. A.

308,122. **Styrol Process.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of O. H. Smith, W. Englewood, N. J., U. S. A.

308,123. **Treating Aldehyde Amines.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of S. I. Strickhouser, Passaic, N. J., U. S. A.

308,302. **Electrodeposition of Rubber.** W. A. Williams, Edinburgh, Scotland.

308,314. **Electrodeposition of Rubber.** Anode Rubber Co., Ltd., London, E. C. 2, England, assignee of P. Klein and A. Szegvari, both of Budapest, Hungary

308,321. **Impregnated Fibrous Materials.** Brown Co., assignee of G. A.

Richter and R. B. Hill, all of Berlin, N. H., U. S. A.

308,322. **Artificial Leather Manufacture.** Brown Co., assignee of G. A. Richter, both of Berlin, N. H., U. S. A.

308,323. **Artificial Leather.** Brown Co., assignee of R. B. Hill, both of Berlin, N. H., U. S. A.

308,347. **Age-Resister.** E. I. duPont de Nemours & Co., assignee of H. W. Elley, both of Wilmington, Del., U. S. A.

308,361. **Rubber Dusting Powder.** Goodyear Tire & Rubber Co., assignee of P. A. Davis, both of Akron, O., U. S. A.

308,362. **Antioxidant.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

308,541. **Rubber Preservative.** B. F. Goodrich Co., New York, N. Y., assignee of W. L. Semon, Cuyahoga Falls, O., both in the U. S. A.

308,542. **Rubber Preservative.** B. F. Goodrich Co., New York, N. Y., assignee of P. C. Jones, Cuyahoga Falls, O., both in the U. S. A.

308,567. **Latex Cement.** Rubber Latex Research Corp., assignee of W. B. Westcott, both of Boston, Mass., U. S. A.

### United Kingdom

338,152. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

338,247. **Composition.** E. O. Cowper, S. Kensington, London.

338,303. **Coloring Rubber.** Dunlop Rubber Co., Ltd., London, D. F. Twiss, E. A. Murphy, and R. G. James, all of Fort Dunlop, Birmingham.

338,381. **Latex in Spinning.** L. S. M. Lejeune, Wasquehal, Nord, and J. E. C. Bongrand, Paris, both in France.

338,534. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

338,536. **Treating Leather.** A. McLellan, Ross, Hereford.

338,698. **Latex Treatment.** H. Beckmann, Zehlendorf, Berlin, Germany.

338,975. **Latex Composition.** Dunlop Rubber Co., Ltd., London, E. A. Murphy, A. Niven, and D. F. Twiss, all of Fort Dunlop, Birmingham.

339,002. **Rubber Composition.** N. Swindin and Nordac, Ltd., both of Middlesex.

339,135. **Synthetic Rubber.** J. Y. Johnson and A. Carpmael, both of London. (I. G. Farbenindustrie A. G., Frankfort, a. M., Germany.)

339,243. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort, a. M., Germany.)

339,255. **Synthetic Rubber.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort, a. M., Germany.)

339,352. **Accelerators.** H. Wade, London. (Rubber Service Laboratories Co., Akron, O., U. S. A.)

339,398. **Isomerized Rubber.** Imperial Chemical Industries, Ltd., London, and E. B. Robinson, Manchester.

339,421. **Attaching Rubber to Metal.** Goodyear Tire & Rubber Co., Akron, assignee of C. M. Carson, Cuyahoga Falls, O., both in U. S. A.

339,730. **Dusting Rubber for Storage.** Goodyear Tire & Rubber Co., Akron, O., assignee of P. Beebe, Los Angeles, Calif., both in the U. S. A.

339,826. **Accelerator.** Deutsche Hydrierwerke A. G., Berlin, Germany.

339,834. **Age-Resister.** B. F. Goodrich Co., New York, N. Y., assignee of P. C. Jones, Cuyahoga Falls, O., both in the U. S. A.

### Germany

519,483. **Preserving Latex.** I. G. Farbenindustrie A. G., Frankfurt a. M.

### France

693,975. **Weather Resisting Compounds.** Imperial Chemical Industries, Ltd.

694,993. **Soluble Cores.** Societa Italiana Pirelli.

695,269. **Rubberlike Masses.** I. G. Farbenindustrie A. G.

695,299. **Polymerization of Butadienic Hydrocarbons.** I. G. Farbenindustrie A. G.

695,441. **Polymerization of Diolefines.** I. G. Farbenindustrie A. G.

695,745. **Rubber Compounds.** I. G. Farbenindustrie A. G.

695,786. **Coagulated Latex Masses.** Metallgesellschaft A. G.

697,090. **Antiagers.** A. C. Burrage, Jr.

697,568. **Rubber Goods.** I. G. Farbenindustrie A. G.

697,630. **Treating Rubber.** Naugatuck Chemical Co.

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## General

### United States

17,956 (Reissue). **Inflatable Article Valve.** B. L. Henry, assignor of one half to E. A. Guinzburg, both of New York, N. Y.

1,789,306. **Tire Filling Valve Head.** A. A. Ewald, Oakfield, Wis.

1,789,365. **Truss.** J. E. Hansen, Rochester, N. Y.

1,789,426. **Spring Suspension.** F. E. Davis, assignor to International Motor Co., both of New York, N. Y.

1,789,725. **Spring Shackle.** R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.

1,789,726. **Transmission Belt.** R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.

1,789,727. **Spring Shackle.** R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.

1,789,748. **Tire Booth.** C. Henry, Flint, Mich.

1,789,761. **Tire Structure.** F. W. Krone, San Francisco, Calif.

1,789,769. **Pneumatic Vehicle Wheel.** S. Munson, Pittsburg, Kan.

1,789,875. **Stair Tread.** E. L. Loudenslager, assignor, by mesne assignments, of one half to A. J. Hosler, both of Toledo, O.

1,789,959. **Stopper.** J. H. Fedeler, New York, N. Y.

1,789,974. **Chair Tip.** F. C. Grant, assignor to Clarin Mfg. Co., both of Chicago, Ill.

1,790,206. **Flexible Diaphragm.** C. C. Farmer, Pittsburgh, assignor to Westinghouse Air Brake Co., Wilmerding, both in Pa.

1,790,217. **Tire Valve Opener.** G. Antanaitis, Mount Carmel, Pa.

1,790,332. **Exchangeable Resilient Heel.** F. Tager, New York, N. Y.

1,790,431. **Wheel Flexible Track.** L. A. Legros, Acton, London, England.

1,790,614. **Wheel Torque Insulator.** A. H. Leipert, College Point, assignor to International Motor Co., New York, both in N. Y.

1,790,629. **Punctureproof Tire.** A. H. Nellen, assignor to Lee Rubber & Tire Corp., both of Conshohocken, Pa.

1,790,696. **Hydrometer Syringe.** E. H. Bridge, Akron, O., assignor to Electric Storage Battery Co., Philadelphia, Pa.

1,790,716. **Fountain Fen.** D. A. McLaughlin, assignor to Parker Pen Co., both of Janesville, Wis.

1,790,756. **Hose Washer.** G. B. Lowery, assignor of one half to M. Johnson, both of Coeur d'Alene, Idaho.

1,790,886. **Heel.** H. M. Tyner, New York, N. Y., and B. L. Smith, Brockton, Mass.; said Smith assignor to said Tyner.

1,790,992. **Cushion Tire.** L. Matlock, Rankin, Tex.

1,791,018. **Tire Inflation Control Valve.** J. W. Williams, Philadelphia, Pa.

1,791,200. **Heel.** B. Gilowitz, New York, N. Y.

1,791,214. **Inner Tube.** W. A. Kline, Middletown, Ill., assignor to A-R Products Corp., Akron, O.

1,791,293. Emergency Tire. J. Steinberg, Brooklyn, N. Y.

1,791,348. **Shampoo Drain.** L. V. Cannady, Denver, Colo.

1,791,402. **Electric Cable.** G. J. Crowdes, Dorchester, assignor to Simplex Wire & Cable Co., Boston, both in Mass.

1,791,415. **Vehicle Shock Absorber.** N. Lacrotte, Paris, France.

1,791,518. **Adjustable Fishing Gaff.** A. I. Woodring, assignor of one-third to G. C. Kennedy, both of Waterloo, Iowa.

1,791,533. **Display Device.** W. B. Parmele, Minneapolis, Minn.

1,791,580 and 1,791,581. **Glove.** H. C. Stokes, assignor to Boss Mfg. Co., both of Kewanee, Ill.

1,791,625. **Grounded Hand Portable.** F. C. Kollath, Chicago, Ill.

1,791,696. **Shower Bath Shield.** G. W. Alexander, Brooten, Minn.

1,791,717. **Hydraulic Diaphragm Brake.** J. A. De Vito, Los Angeles, Calif.

1,791,737. **Flexible Sealing Ring.** H. A. Miller, Akron, O., assignor to Seiberling Rubber Co., a corporation of Del.

1,791,749. **Buffer.** R. Beynon, assignor to Dryden Rubber Co., both of Chicago, Ill.

1,791,856. **Structural Material.** C. A. Van Dusen, assignor to Glenn L. Martin Co., both of Cleveland, O.

1,791,932. **Electrical Stethoscope.** F. E. Miller, New York, N. Y.

1,791,935. **Tire Casing Cushion.** H. Omenitsch, Jackson Heights, assignor of one-third to A. Baumann, Elmhurst, L. I., and one-third to H. Holden, New York, all in N. Y.

1,792,038. **Vehicle Leaf Spring Suspension.** L. Rossi, Turin, Italy.

1,792,070. **Spring Shackle.** R. H. Chilton, assignor to Inland Mfg. Co., both of Dayton, O.

1,792,083. **Abrasive Wheel.** J. R. Gammeter, assignor to George W. Perks Co., both of Akron, O.

1,792,117. **Bathing Suit Pocket.** S. Paull, New York, N. Y., assignor to Waterproof Pocket Corp., a corporation of N. Y.

1,792,123. **Tire Inflator.** R. L. Rymal, Riverside, Ill.

1,792,125. **Life Preserving Suit.** A. D. Shave, Port Aux Basques, Newfoundland.

1,792,135. **Advertising Display Device.** H. J. Zieman, Milwaukee, Wis.

1,792,138. **Splash Catcher,** G. Böllert, Hamburg, Germany.

1,792,211. **Golf Ball Cleaner.** E. G. Brewer, Teddington, England.

1,792,285 and 1,792,286. **Aerator.** W. H. Curry and H. F. Dietz, both of Salt Lake City, Utah, assignors to Hewitt-Gutta Percha Rubber Corp., Buffalo, N. Y.

1,792,301. **Bailer.** C. C. Heeter, assignor to C. M. Heeter Sons & Co., Inc., both of Butler, Pa.

1,792,619 **Tire Valve Stem.** J. Wahl, Rosedale, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,792,659. **Tire Valve Cap.** M. C. Schweinert, New York, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,792,715. **Article Supporter.** J. J. Steinharter, New York, assignor, by direct and mesne assignments, to Cable Radio Tube Corp., Brooklyn, both in N. Y.

1,792,825. **Tire Valve Sealer.** G. E. Disney, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,792,842. **Spring Shackle.** A. J. Jansson, Flint, assignor to General Motors Corp., Detroit, both in Mich.

1,792,872. **Motor Mounting.** C. Saurer, assignor to Mechanical Rubber Co., both of Cleveland, O.

1,792,876. **Vehicle Resilient Support.** J. E. Stout, Mount Dora, Fla.

1,792,901. **Pneumatic Tire Shoe.** C. F. Goodfriend, Jersey City, N. J.

1,792,903. **Dental Mortar.** L. Haller, Stuttgart, Germany.

1,792,921. **Power Transmitting Mechanism.** R. C. Newhouse, assignor to Allis-Chalmers Mfg. Co., both of Milwaukee, Wis.

1,792,938. **Arch Protector.** J. E. Stagl, Brooklyn, N. Y.

1,792,981. **Hair Curler.** H. Hammond, Balham, assignor to S. and L. H. Marcell, trading as Watric Co., all of London, England.

1,793,335. **Doll.** M. Sanders, Arverne, assignor to Ideal Novelty & Toy Co., Brooklyn, both in N. Y.

1,793,366. **Flytrap.** W. C. Hisey, Washington, D. C.

1,793,429. **Tire Inflator.** E. G. Mascarenhas, Juiz De Fora, Brazil.

## Dominion of Canada

308,039. **Tire Bead Reenforcement.** T. Gore, New York, N. Y., U. S. A.

308,120. **Balloon Tire.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of C. J. Dolding, Detroit, Mich., U. S. A.

308,216. **Buffer and Draw Gear.** A. Spencer and R. T. Glascodine, co-inventors, both of London, S. W., England.

308,253. **Inner Tube.** A. G. Fitz Gerald, W. Newton, Mass., U. S. A.

308,280. **Garter.** J. Mieres, Buenos Aires, Argentina.

308,349. **Gramophone Pickup Device.** Electramonic Co. (1930) Ltd., London, S. E. 15, assignee of S. J. and L. N. Tyrrell, both of Yiewsley, Middlesex, and D. W. Sayers, Beckenham, Kent, all in England.

308,479. **Automobile Bumper Guard.** W. J. Millard, New York, N. Y., U. S. A.

308,723. **Flexible Connector.** Inland Mfg. Co., assignee of H. D. Geyer, both of Dayton, O., U. S. A.

## United Kingdom

338,073. **Bottle Closure.** J. W. Hansteen, Blommenholm, Norway.

338,132. **Spring Tire.** D. E. Jones, Monmouthshire.

338,266. **Arch Supporter.** C. H. Rayne, London.

338,328. **Tire Deflation Indicator.** J. Heller, Ludas, Roumania.

338,338. **Garter Belt.** J. V. Moore, Pawtucket, R. I., U. S. A.

338,375. **Mudguard Antisplash Device.** A. G. Barrett and Leicester Rubber Co., Ltd., both of Leicester.

338,485. **Inner Tube.** A. E. Stanley and E. Jones, both of London.

338,563. **Cycle Pedal.** E. W. Elson and Rudge-Whitworth, Ltd., both of Coventry.

338,632. **Aircraft.** W. V. Gilbert, London.

338,634. **Air Cushion.** W. H. Smith, Manchester, and H. C. Stanley, Birmingham.

338,646. **Furniture Tips.** J. P. Schmidt, Remscheid, Germany.

338,678. **Electric Hand Lamp.** Harris & Sheldon, Ltd., and R. G. Turner, both of Birmingham.

338,694. **Lifeboat.** Tees Side Bridge & Engineering Works, Ltd., and J. B. Peat, both of Middlesbrough.

338,792. **Percussive Drill.** H. S. Potter, Johannesburg, South Africa.

338,862. **Artificial Denture.** A. E. White, London. (H. D. Morgan, Youngstown, O., U. S. A.)

338,954. **Hair Waver.** H. C. and M. A. Fraser, both of Bournemouth.

338,957. **Lighting Torch.** E. R. Beney, London.

339,008. **X-Ray Film Slide.** W. E. Schall and Schall & Son, Ltd., both of London.

339,027. **Cycle Saddle.** H. & J. Jelley, both of Birmingham.

339,075. **Diaphragm.** S. J. Bush and N. Steele, both of Sheffield.

339,104. **Electric Cable.** C. J. Beaver, N. Dixon, both of Cheshire, and W. T. Glover & Co., Ltd., Manchester.

339,106. **Joint Antirupture Device.** Goodyear Tire & Rubber Co., assignee of B. C. Eberhard, both of Akron, O.

339,131. **Horseshoe.** R. R. Tweed, Audubon, N. J., U. S. A.

339,136. **Diaphragm.** Barostat Co., assignee of A. J. Tigges, of Jackson & Moreland, both of Boston, Mass., U. S. A.

339,154. **Raincoat.** A. Whyman, Chapeltown, Leeds.

339,163. **Horseshoe.** J. E. Pollak, London. (Imperator Hestesko Aktieselskabet, Tönsberg, Norway)

339,170. **Shank Stiffener.** G. E. Karlson, Stockholm, Sweden.

339,193. **Horseshoe.** J. E. Pollak, London. (Imperator Hestesko Aktieselskabet, Tönsberg, Norway.)

339,325. **Advertising Sign.** S. Dobrusskin, Berlin, Germany.

339,375. **Cable.** C. W. Bloomfield, Surrey.

339,380. **Disinfecting Telephone Mouthpiece.** G. H. Lucas, London.

339,391. **Loudspeaker.** United Reproducers Patents Corp., St. Charles, Ill., U. S. A.

339,403. **Spring Wheel.** J. Watson, Nottingham.

339,411. **Mangle Roller.** Whittaker Bros. (Accrington), Ltd., and J. A. Duckworth, both of Lancashire.

339,523. **Tire Valve Inflator.** J. C. Crowley, Cleveland Heights, O., U. S. A.

339,598. **Ship Window.** J. Stone & Co., Ltd., and E. W. Cotter, both of London.

339,605. **Chains.** Roadless Traction, Ltd., Middlesex, and O. S. Penn, Sunbury-on-Thames.

339,696. **Suspender Clip.** R. Gattelet, Paris, France.

339,704. **Racket for Games.** M. E. Palmer, London.

339,707. **Window Strap.** Dunlop Rubber Co., Ltd., London, F. W. Warren, J. Reid, and W. J. Dexter, all of Manchester.

339,708. **Tire Pressure Gage.** A. Schrader's Son, Inc., Brooklyn, assignee of J. Wahl, Rosedale, and O. Melzer, Hollis, all in N. Y., U. S. A.

339,742. **Tire.** Dunlop Rubber Co., Ltd., London, F. Fellowes and F. A. Nicholas, both of Fort Dunlop, Birmingham.

339,773. **Spring Wheel.** Electromechanical Brake Co., Ltd., and L. A. Catlin, both of W. Bromwich.

339,780. **Buffer and Drawgear.** G. Spencer, Moulton & Co., Ltd., and R. L. Whitmore, both of Westminster.

339,805. **Automobile Hood.** Sunsaloon Bodies, Ltd., Edinburgh, Scotland, and D. A. Pearson, Birmingham.

339,809. **Tire.** A. Tyler, Cumberland, Md., U. S. A.

## Germany

518,970. **Barrel Tester.** Wehrle-Werk A. G. Emmendingen, Baden.

519,351. **Pessary.** W. Neumann, Hamburg.

519,569. **Nipple.** G. Hollstein, Porz, Rhld.

519,861. **Driving Belt.** P. L. Gardère, Bordeaux, France. Represented by A. Demeter, Berlin S. W. 68.

### Designs

1,150,072. **Container.** Harburger Gummiwaren-Fabrik Phoenix A. G., Harburg-Wilhelmsburg.

1,154,984. **Heel Patch.** Kongo Gummi-Gesellschaft H. Chormann, Dusseldorf.

1,155,047. **Candlestick Collar.** Siemens-

Schuckertwerke, A. G., Berlin-Siemensstadt.

1,155,099. **Artificial Sponge.** I. G. Farbenindustrie, A. G., Frankfurt a. Main.

1,155,124. **Pot Closure.** M. Barth, Lausa-Weixdorf b. Dresden.

1,155,399. **Hollow Tire.** Gummiwaren-Fabrik Grahners & Borner, Zipsendorf, Bez. Leipzig.

1,155,596. **Cable Joint Packing.** H. Maehler, Nieder-Ingelheim.

1,155,691. **Webbing.** Cosman, Villbrandt & Zehnder A. G., (Vereinigte Gummiband Fabriken), Wuppertal-Elberfeld.

1,155,755. **Heel Patches.** G. Gartner, Gevelsberg i. W.

1,155,813. **Sponge Rubber for Medical Instruments.** O. Rosenstock, Kassel-Wilhelmshohe.

1,155,884. **Insulated Conductor.** Allgemeine Elektricitats-Gesellschaft, Berlin N. W. 40.

1,155,887. **Hose Wire.** Allgemeine Elektricitats-Gesellschaft, Berlin N. W. 40.

1,156,068. **Rubberized Fabric Belt.** F. Clouth Rheinische Gummiwarenfabrik A. G., Kiln-Nippes.

1,156,536. **Belt Edge Protection.** Veritas Gummiwerke A. G., Berlin-Lichterfelde-Ost.

1,156,994. **Elastic Connection.** Continental Gummi-Werke A.G., Hannover.

1,157,090. **Setting Soles in Rubber.** A. Ploger, Bad Salzuflen.

1,157,706. **Nipple.** P. Fohgrub, Glindow, Zauche.

1,157,576. **Hydrometer.** H. Pipersberg, Jr., Luttringhausen, Rhld.

1,157,759. **Corselette.** E. Lowenthal, Aschaffenburg a. M.

1,157,767. **Brush Roll with Rubber Caps.** W. Knoefel & Co., K. G. Weimar-Grosskromsdorf i. Th.

1,157,781. **Flexible Shaft.** Ackermann & Schmitt, Stuttgart-Ostheim.

1,157,847. **Pinch Cock.** Firma B. Braun, Melsungen.

### France

693,766. **Clothes Hangers.** Societe du Caoutchouc Manufacture.

693,890. **Rubberized Fabrics.** E. I. du Pont de Nemours & Co.

694,061. **Footwear.** I. T. S. Rubber Co., Ltd., and F. E. East.

694,592. **Inner Tube Valves.** Societe Nouvelle des Etablissements Bardin, Renard et Couche.

694,626. **Tire Patches.** G. A. Melot.

695,288. **Eraser.** Etablissements P. Orange & Cie.

695,526. **Inner Tubes.** W. S. Kopczewski,

695,567. **Multiple Inner Tube.** U. Gentili.

695,994. **Cellular Inner Tube.** A. E. Durfort.

696,718. **Tire Valves.** Societe Anonyme Edouard Dubied & Co.

696,943. **Nonskid Horse Shoe.** J. R. Bezert.

696,949. **Sectional Tire.** A. Castellani.

696,952. **Protection for Pneumatics.** A. Horrut.

697,247. **Carpet.** L. Tricerri.

697,480. **Overshoes.** Mishawaka Rubber & Woolen Mfg. Co.

# Trade Marks

## United States

279,519. **Cosavult.** Partly prepared unvulcanized natural and synthetic rubber coagulates. I. G. Farbenindustrie A. G., Frankfort a. M., Germany.

279,541. **Nukaf.** Rubberized textile fabric. Hodgman Rubber Co., Framingham, Mass.

279,560. **Arnoldaire.** Footwear. M. N. Arnold Shoe Co., N. Abington, Mass.

279,561. **Arnoldee.** Footwear. M. N. Arnold Shoe Co., North Abington, Mass.

279,567. Coat-of-arms and the words: **"Betsy Perkins. Strawbridge & Clothier."** Footwear. Strawbridge & Clothier, Philadelphia, Pa.

279,612. Horizontal diamond and the word: **"Viking."** Footwear. Röwde & Co., Oslo, Norway.

279,626. **Leagrass.** Pile fabrics simulating grass for surfacing of golf courses, etc. Lea Fabrics, Inc., Newark, N. J.

279,659. **Super. Best Made.** Garden hose. Sears, Roebuck & Co., Chicago, Ill.

279,664. Representation of a pyramid and a camel, and the words: **"Camel. Easy Walking."** Soles and heels. Victor Products Corp., Winchester, Va.

279,665. **Hy-Flex.** Heels. Essex Rubber Co., Inc., Trenton, N. J.

279,677. **I.D.A.** Bathing caps. Independent Druggists' Alliance Distributing Co., Chicago, Ill.

279,679. **Chisholm's .Foot Freedom. Narrow Heel.** Footwear. Chisholm Shoe Co., Cleveland, O.

279,680. **Arnoldeagle.** Footwear. M. N. Arnold Shoe Co., N. Abington, Mass.

279,681. **Arnoldoon.** Footwear. M. N. Arnold Shoe Co., North Abington, Mass.

279,687. **"Archeroid" Sport Fabric.** Waterproof clothing. Archer Rubber Co., Milford, Mass.

279,689. Representation of a wreath, and the words: **"Fits the Arch. J. & K."** Footwear. Julian & Kokenge Co., Cincinnati, O.

279,694. Representation of a section of colored hose. Fire hose. Manhattan Rubber Mfg. Co., Passaic, N. J., assignor to Raybestos-Manhattan, Inc., a corporation of N. J.

279,695. Representation of a wreath, and the words: **"The J & K Shoe Fits the Arch."** Footwear. Julian & Kokenge Co., Cincinnati, O.

279,702. **Demon.** Golf balls. Arlington Rubber Co., Dorchester, Mass.

279,714. **Rubberset.** Elastic fabric and webbing. American Mills Co., Waterbury, Conn.

279,779. **Cameron.** Footwear, Julius Grossman, Inc., Brooklyn, N. Y.

279,914. Hexagon, containing the words: **"Trade Mark,"** and a smaller hexagon containing the words: **"Stella Packing."** Packing. C. L. Willis, New York, N. Y.

279,944. **Approved.** Elastic hosiery, hot water bottles, fountain syringes, gloves, sheeting, etc. Sears, Roebuck & Co., Chicago, Ill.

279,957. Double ellipse containing the words: **"Artco Products."** Waterproof shower curtains. Artcraft Valance Mfg. Co., Seattle, Wash.

280,065. Representation of a spider's web and thereupon the words: **"Cam-Bal."** Balls. C. B. Webb Co., New York, N. Y.

280,078. Label containing representation of four surgeons, and the word: **'Weck."** Surgeons' gloves, etc. Edward Weck & Son, Inc., Brooklyn, N. Y.

280,082. **Unika.** Finger cots. United States Rubber Co., New York, New York.

280,092. **Darb.** Golf balls. Bon-Dee Golf Ball Co., Detroit, Mich.

280,110. **Parkdale.** Golf balls. Bon-Dee Golf Ball Co., Detroit, Mich.

280,229. Representation of a Scotch boy and the words: **"Scotch Boy Tape."** Friction tape. New York Insulated Wire Co., Wallingford, Conn.

280,291. **R. Mercurogum.** Medicated chewing gum. Berrien Laboratories, Inc., St. Joseph, Mich.

280,322. **Old Gold.** Golf balls. Burke Golf Co., Newark, O.

280,340. **Kantsink.** Life preservers. Enterprise-Moakler Co., doing business as Kapo Products Co., Boston, Mass.

280,344. **Oxford.** Dress shields. Rand Rubber Co., Inc., Brooklyn, N. Y.

280,357. Circle containing the words: **"Monarch Outdoor Garments,"** and a smaller circle thereupon containing a representation of a crown made of the word: **"Monarch."** Rubberized clothing, etc. Monarch Mfg. Co., Milwaukee, Wis.

280,372. **Monarch 10-Point Coat.** Rubberized clothing, etc. Monarch Mfg. Co., Milwaukee, Wis.

280,374. **Conforma.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.

280,375. **L'Avenue.** Footwear. Lord & Taylor, New York, N. Y.

280,384. **Salon-Ette.** Footwear. Shoecraft Shop, Inc., New York, N. Y.

280,392. **Mussel Soles.** Footwear. C. H. Daniels, Boston, Mass.

280,418. **Dreadnot.** Heels and soles. Victor Products Corp., Winchester, Va.

280,506. Horizontal black strip containing the words: **"Roguish Brogue."** Footwear. Marathon Shoe Co., Wausau, Wis.

280,515. **Mother Nature.** Footwear. Chicago Mail Order Co., Chicago, Ill.

280,524. **Tuftex.** Heels. E. H. Clapp Rubber Co., Boston, Mass.

280,530. **Peni-Arch.** Footwear. J. C. Penney Co., Wilmington, Del.

280,546. Fanciful design containing representation of a fish, and the word: **"Marcellette."** Bathing caps. L. M. Jones, Tacoma, Wash.

280,549. **Health Hikers.** Footwear. E. J. Ramsey, doing business as Ramsey's "They Cannot Rip," New York, N. Y.

280,559. **Harwood's Aspirin Gum.** Chewing gum containing acetylsalicylic acid for the relief of simple headaches, etc. J. De Vautibault, doing business as Aspirin Gum Sales Co., New York, N. Y.

280,566. **Dack's.** Footwear. Dack's Shoes, Inc., Detroit, Mich.

### Dominion of Canada

51,227. **Feminaid.** Rainwear, etc. J. C. Penney Co., New York, N. Y.

51,248. **Ponkoid.** Pyroxylin and rubber coated fabrics. Canadian Industries, Ltd., Montreal, P. Q.

51,309. **No-Trax.** Soles and heels. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

51,389. **Royal.** Erasers, etc. Eagle Pencil Co., New York, N. Y., U. S. A.

### United Kingdom

512,586. **Norbrit.** All goods included in Class 38, but excluding men's socks and stockings. North British Rubber Co., Ltd., Edinburgh, Scotland.

513,220. A shield containing representation of a lion, and the words: **"All British."** Soles. Rubber Heel Mfg. Co., Manchester.

518,029. **Leeford.** Raincoats. Wright & Peel, Ltd., Yorkshire.

518,258. **Impervo.** Tapes. Canfield Rubber Co., Bridgeport, Conn., U. S. A.

518,585. Double diamond containing the monogram: **"AS."** Rubber goods. Avon India Rubber Co., Ltd., Melksham, Wiltshire.

518,814. **Pingo.** Hand stamps. Pneumatic Rubber Stamp Co. (Buck's Patent), Ltd., London, E. C. 4.

519,034. **Irmac.** Tubular hose. William Warne & Co., Ltd., Essex.

519,212. **Rubstud.** Boot studs. H. Norman, Buckinghamshire.

519,296. **Wayfarer.** Tires and tubes. Pirelli, Ltd., London, E. C. 4.

## Designs

### United States

83,113. **Bathtub Mat.** Term 14 years. G. A. Lepke, Little Neck, N. Y.

83,150. **Heel.** Term 14 years. H. Crossman, Brookline, A. Greenbaum, Beachmont, and M. J. Bernstein, Brookline, assignors to Panther Rubber Mfg. Co., Stoughton, all in Mass.

83,169 and 83,170. **Sole.** Term 3½ years. J. J. O'Neil, Winchester, assignor to Converse Rubber Co., Malden, both in Mass.

83,189. **Sole.** Term 14 years. H. Crossman, Brookline, A. Greenbaum, Beachmont, and M. J. Bernstein, Brookline, assignors to Panther Rubber Mfg. Co., Stoughton, all in Mass.

83,190. **Stencil Brush.** Term 14 years. T. B. Denton, E. Orange, N. J., assignor to Rubber & Celluloid Products Co., a corporation of N. J.

83,316. **Combined Sole and Heel.** Term 7 years. R. E. Drake, Brockton, assignor to Avon Sole Co., Avon, Mass.

83,394. **Shoe Tap.** Term 14 years. P. R. Drew, Cambridge, Mass., assignor to B. F. Goodrich Co., New York, N. Y.

83,396. **Gaiter.** Term 3½ years. H. J. Gusken, assignor to Goodyear's India Rubber Glove Mfg. Co., both of Naugatuck, Conn.

## Prints

### United States

12,962. **Air-Flight Principle for Your Car.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.

12,963. **For Dad.** Tires and tubes. Fisk Tire Co., Inc., Chicopee Falls, Mass.

12,964. **The Air-Flight Principle.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.

12,965. **For Air-Flight Riding Ease.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.

12,966. **Ride on Air.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.

13,034. **Ride on Relaxed Rubber.** Tires. General Tire & Rubber Co., Akron, O.

# European Notes

(*Continued from page* 90)

decorating tombstones; when paint, rust, etc., have to be removed from buildings, bridges, etc., hose with 40 to 42 mm. diameter is employed.

Another important use for this hose is in applying rough cast to buildings, by a cement gun, according to the Torkret process, when the hose must have particularly thick walls and diameter of 20 to 40 mm. It is used in a similar manner when shafts and galleries have to be dammed up in mines when water breaks through, fires occur, or similar troubles arise.

In the iron, metal, and tombstone industries the lengths of hose required run from 1½ to 5 m.; but in the painting, building, and mining industries hose in lengths up to 30 m. is in use. (Meter = 39.37 inches, millimeter = .0394 inch.)

### Company Notes

Georg Haertel, K.G., Karlstrasse 26, Berlin N.W.6., has patented surgeons' gloves which are of one color on the inner surface and of another on the back. To obtain the two colors the gloves are dipped a second time in a solution of a different color from the original solution from which the entire gloves are made. This dipping is done in such a manner that the palms of the gloves and the inner surface of the fingers right over the tips are coated with the new solution, leaving the back the original color.

A flexible sponge rubber diathermic electrode is produced by drawing over the rubber small sacks of woven metal which are electrically conductive. The advantage of this arrangement is that good conductivity is insured; also the sponge rubber conforms to any part of the body, thus preventing the production of sparks. The manufacturers are A. G. Metzeler & Co., Munich.

R. & J. Dick Co., Glasgow, Scotland, has established a branch, R. & J. Dick Treibriemen Gesellschaft m.b.H., Berlin, to manufacture and sell technical goods and belting, particularly R. & J. Dick belting.

## FRANCE

### Rubber for Crematories

In a recent issue of *Caoutchouc et la Gutta-percha*, R. Ditmar discusses the possibilities of hard and soft rubber for making urns and receptacles for use in crematories. It had been suggested in Germany that urns be made of rubber to replace those of pottery usually employed, because they resembled preserve jars, and also produced a metallic noise when moved about.

For eliminating the rattling sound a soft rubber pouch in which the ashes could be enclosed is suggested. The earthenware receptacle might be replaced by one of metal covered with hard rubber or made entirely of it. The urn could also be made of hard rubber and have appropriate decorations molded in its surface.

Receptacles and urns would be finished with screw threads and hermetically sealed by applying some adhesive with latex base to the thread and then screwing the cover on tightly. If less durable urns are required, thin molded gutta percha would answer very well.

### Vulcafixe Color Pastes

Vulcafixe pastes are produced by combining the colors with softeners which have no injurious effects on the aging of vulcanized rubber and which aid the dispersion of the colors. It is claimed that the paste is easy to handle, melting rapidly on slightly warm cylinders, and disperses rapidly and thoroughly in the rubber during compounding. The colors may be added during the last stages of compounding so that the same white basic mix may be made in advance and serve for articles of different colors. Similarly, for spreading purposes, a single uncolored solution can be made first and then divided into portions to be colored as required.

These pastes are said to give almost as good results in the manufacture of transparent goods as colors soluble in rubber, without presenting the same disadvantages. The colors resist vulcanization by any process, are economical to use as they are more intense than those of the corresponding Vulcafixe powder colors, and the paste contains no factice.

These colors are put on the market by Société Anonyme des Matières Colorantes et Produits Chimiques de Saint-Denis.

### Company Notes

O. Englebert Fils et Cie., Liege, Belgium, has established a branch at Paris, called Société Anonyme des Matières Colorantes company, which will sell the products of the Belgian parent firm and later on possibly will also manufacture all kinds of rubber goods, has a capital of one million francs, divided into shares of 1,000 francs each.

The Michelin firm has been experimenting on the Issoudun-Saint-Florent line with the application of pneumatic tires to railway carriages. The advantages claimed for this departure are that if generally introduced, noise and shock would be eliminated, and the wear of the rails would be lessened.

# MARKET REVIEWS

## Crude Rubber

### New York Exchange

RUBBER is in almost the same statistical position as it was last month. Consumption is behind last year's, stocks here and abroad continue to pile up; and little evidence of lessened production is seen in the Far East. A small reduction occurred on large and small estates, but dealers' stocks were up, offsetting this advantage.

It might be well to note here that statistics that do not compare favorably with last year's figures have been classified as bearish, even though they may show an increase over previous months of the present year. The year 1930 was not an inflation year like 1929, and it seems fair to draw comparisons with it in 1931.

The efforts of the Dutch and British to get together and formulate a satisfactory plan for restriction has dominated the market. Good and bad news sent the market to new highs and new lows.

But on March 25 it was definitely stated that all efforts at restriction had been abandoned. On receipt of the news the market both here and in London dropped to new record low levels of 7 cents.

Government support had been doubtful, but large growers had been counted on to support the effort. These growers, however, announced definitely that they would not support a restriction scheme.

By some traders this statement was considered a severe blow to the industry, and it is not expected that rubber will get on its feet again for a long time to come. It simply means that rubber will continue at its present levels until the producers are ruined and have to abandon their estates.

Price differentials on plantations delivered on "A" contracts during April are: off quality first latex crepe, .2 cents a pound; good f. a. q. ribs, .25 cents a pound; ordinary f. a. q. ribs, .5 cents a pound.

Week ended February 28. After Washington's birthday crude rubber set a new low record of 7.10 cents in the old March delivery. The liquidation that was responsible for this record low figure soon spent itself; and prices recovered until they were about 40 points higher, where they closed at the end of the week.

The gain had no significance. It simply meant that the market was oversold for the present. Dealers absorbed the selling, steadying the market even in the face of unfavorable statistics. The rise started on Wednesday, continued until Friday, but was a bit easy again on Saturday.

The stock market has had little effect on rubber in the last few weeks. In the face of the sharp rise registered in securities, rubber dropped; when the stock market turned reactionary, the rubber market showed strength. There will probably be little action of the rubber market which can be ascribed to sympathy with the movements on the securities market.

The Census Bureau issued figures on automobile production during the week. Production in January amounted to 171,903 vehicles, a seasonal increase of 16,197 over December.

The unfavorable statistics we mentioned above came from the Far East. Shipments of crude rubber from the Dutch East Indies during January amounted to 23,978 tons, compared with 22,277 tons during December, 1930, and with 22,821 tons in January, 1930. Only Java and Madeira exported less than in December.

Crude rubber stocks on Eastern estates amounted to 25,770 tons, dry basis, during January, compared with 25,837 tons at the end of 1930. Declared production for the month was 20,792 tons on large estates, against 22,341 tons in December. That for estates under 100 acres in size, however, totaled 18,129 tons against 16,186 during December. Dealers stocks were larger, amounting to 19,516 tons, compared with 18,686 tons for the previous month.

The significance of these figures lies in the fact that there is still no evidence of reduced production of crude rubber. Predictions of curtailed operations have been made for the last two or three months, but the time is long past for the cut in production to show itself. Low prices seem to have no effect; therefore it is hard to say just when production will be stopped to any appreciable degree. There must be something to the estimates which give the cost of producing rubber at the low figure of 7 cents. The continued high rate of output is having a paralyzing effect on the market, adding tonnage to surplus stocks that are already excessive.

Prices at the close of February 28 on No. 1 Standard contract follow:

**RUBBER BULL POINTS**

1. Crude rubber production on Far Eastern estates under 100 acres in size amounted to 16,858 tons during February. This figure compared with 18,192 tons in January. On estates over 100 acres, production was 18,779 tons, against 20,792 tons.
2. Imports of rubber during February were 36,645 tons, compared with 37,098 tons during January and 43,728 tons in February. For the first two months of this year the total was 73,743 tons, compared with 91,090 tons for the similar period last year.
3. February automobile registrations are estimated to be 9 per cent greater than in January, 4 per cent over December, and 39 per cent over November.
4. Pneumatic casings on hand January 31 declined 1 per cent from December 31, and were 24.9 per cent below January 31, 1930.
5. February production of automobiles was 29 per cent over January, the highest mark in six months.

**RUBBER BEAR POINTS**

1. Restriction agreement between Dutch and British failed.
2. At the end of February the combined American supplies, domestic stocks plus rubber afloat, totaled 276,513 tons, a new record high total, compared with 265,675 tons at the close of January and 198,194 tons at the close of February, 1930.
3. London and Liverpool stocks have increased steadily every week.
4. Shipments of pneumatic tire casings for January increased 11.4 per cent over December, but were 15 per cent less than in January, 1930.
5. Far East dealers' stocks at Singapore, Penang, etc., at the end of February totaled 42,986 dry tons against 42,202 at the end of January and 40,293 a year ago.
6. Consumption of crude rubber by American manufacturers during February was 28,797 tons, compared with 28,557 tons consumed in January, and 32,726 tons during February, 1930.

### The Rubber Exchange of New York, Inc.

**DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND—NO. 1 STANDARD CONTRACTS**

| Positions 1931 | February, 1931 | | | | | | March, 1931 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23* | 24 | 25 | 26 | 27 | 28 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 |
| Feb. | ... | 7.25 | 7.35 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Mar. | ... | 7.35 | 7.45 | 7.48 | 7.55 | 7.62 | 7.70 | 7.85 | 8.30 | 8.07 | 8.00 | 8.02 | 7.74 | 7.85 |
| Apr. | ... | 7.47 | 7.56 | 7.59 | 7.66 | 7.73 | 7.82 | 7.97 | 8.40 | 8.17 | 8.08 | 8.11 | 7.82 | 7.97 |
| May | ... | 7.60 | 7.68 | 7.70 | 7.78 | 7.85 | 7.93 | 8.10 | 8.50 | 8.27 | 8.17 | 8.20 | 7.90 | 8.10 |
| June | ... | 7.70 | 7.77 | 7.80 | 7.89 | 7.95 | 8.03 | 8.20 | 8.59 | 8.37 | 8.25 | 8.28 | 8.00 | 8.18 |
| July | ... | 7.80 | 7.86 | 7.90 | 8.00 | 8.05 | 8.13 | 8.30 | 8.68 | 8.47 | 8.33 | 8.37 | 8.10 | 8.25 |
| Aug. | ... | 7.90 | 7.96 | 8.00 | 8.09 | 8.14 | 8.22 | 8.43 | 8.79 | 8.56 | 8.44 | 8.47 | 8.20 | 8.38 |
| Sept. | ... | 8.00 | 8.06 | 8.10 | 8.18 | 8.24 | 8.32 | 8.55 | 8.90 | 8.66 | 8.54 | 8.57 | 8.30 | 8.50 |
| Oct. | ... | 8.12 | 8.18 | 8.22 | 8.29 | 8.34 | 8.44 | 8.65 | 9.00 | 8.75 | 8.64 | 8.66 | 8.40 | 8.60 |
| Nov. | ... | 8.23 | 8.30 | 8.34 | 8.40 | 8.45 | 8.53 | 8.75 | 9.10 | 8.85 | 8.74 | 8.76 | 8.50 | 8.68 |
| Dec. | ... | 8.35 | 8.42 | 8.45 | 8.50 | 8.55 | 8.66 | 8.85 | 9.20 | 8.95 | 8.84 | 8.85 | 8.60 | 8.75 |
| 1932 | | | | | | | | | | | | | | |
| Jan. | ... | 8.45 | 8.54 | 8.56 | 8.65 | 8.68 | 8.76 | 8.95 | 9.30 | 9.05 | 8.94 | 8.95 | 8.65 | 8.83 |
| Feb. | ... | .... | .... | .... | .... | .... | 8.86 | 9.05 | 9.40 | 9.15 | 9.04 | 9.05 | 8.78 | 8.90 |

* Holiday.

| Positions 1931 | March, 1931 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11 | 12 | 13 | 14 | 16 | 17 | 18 | 19 | 20 | 21 | 23 | 24 | 25 |
| Feb. | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Mar. | .... 7.75 | 7.90 | 7.75 | 7.60 | 7.65 | 7.85 | 7.75 | 7.65 | 7.55 | 7.55 | 7.55 | 7.50 | 7.10 |
| Apr. | .... 7.87 | 8.00 | 7.84 | 7.70 | 7.70 | 7.92 | 7.75 | 7.72 | 7.64 | 7.60 | 7.60 | 7.55 | 7.10 |
| May | .... 7.99 | 8.10 | 7.93 | 7.80 | 7.76 | 8.00 | 7.85 | 7.90 | 7.74 | 7.80 | 7.75 | 7.58 | 7.32 |
| June | .... 8.07 | 8.18 | 8.03 | 7.90 | 7.83 | 8.08 | 7.93 | 7.96 | 7.81 | 7.87 | 7.83 | 7.66 | 7.39 |
| July | .... 8.15 | 8.25 | 8.13 | 8.00 | 7.90 | 8.15 | 8.01 | 8.03 | 7.88 | 7.95 | 7.92 | 7.75 | 7.47 |
| Aug. | .... 8.25 | 8.36 | 8.21 | 8.10 | 8.00 | 8.22 | 8.10 | 8.11 | 7.95 | 8.02 | 7.99 | 7.82 | 7.54 |
| Sept. | .... 8.36 | 8.48 | 8.30 | 8.20 | 8.12 | 8.30 | 8.20 | 8.20 | 8.05 | 8.10 | 8.07 | 7.90 | 7.61 |
| Oct. | .... 8.44 | 8.56 | 8.41 | 8.30 | 8.23 | 8.42 | 8.30 | 8.30 | 8.14 | 8.15 | 8.18 | 8.00 | 7.70 |
| Nov. | .... 8.52 | 8.65 | 8.52 | 8.40 | 8.33 | 8.53 | 8.40 | 8.41 | 8.23 | 8.27 | 8.29 | 8.10 | 7.80 |
| Dec. | .... 8.61 | 8.75 | 8.65 | 8.48 | 8.44 | 8.65 | 8.50 | 8.52 | 8.32 | 8.38 | 8.40 | 8.20 | 7.90 |
| 1932 | | | | | | | | | | | | | |
| Jan. | .... 8.71 | 8.85 | 8.75 | 8.58 | 8.54 | 8.75 | 8 60 | 8.62 | 8.43 | 8.48 | 8.50 | 8.28 | 8.00 |
| Feb. | .... 8.81 | 8.95 | 8.85 | 8.68 | 8.64 | 8.85 | 8.70 | 8.72 | 8.53 | 8.58 | 8.60 | 8.36 | 8.10 |

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | ... | ... | 7.62/7.70 | 7.55 |
| Apr. | ... | ... | 7.73 | 7.66 |
| May | ... | ... | 7.85/7.90 | 7.78/7.82 |
| June | ... | ... | 7.95 | 7.89 |
| July | 8.08 | 8.08 | 8.05/8.09 | 8.00 |
| Aug. | ... | ... | 8.14 | 8.09 |
| Sept. | ... | ... | 8.24/8.28 | 8.18/8.22 |
| Oct. | ... | ... | 8.34 | 8.29 |
| Nov. | ... | ... | 8.45 | 8.40 |
| Dec. | 8.57 | 8.56 | 8.55/8.58 | 8.50/8.52 |
| Jan. | ... | ... | 8.68 | 8.65 |
| Spot | ... | ... | 7.70 | 7.62 |

Week ended March 7. The old, old story in the rubber industry was revived again in the last week. It was reported that British and Dutch rubber growers were meeting to consider another restriction scheme.

The scheme considered this time is called the Maxwell plan. It is based on the pivotal price of 9 pence for rubber with a 25 per cent restriction of exports. Below that level restrictions would be applicable on all rubber except from the Dutch East Indies, which is covered by a special 10 per cent duty.

According to a spokesman of the British government, "The British Government's attitude appears to be one of helpful support if some practical scheme is put forward, but the Colonial Secretary has declared that it is not the government's intention to initiate any scheme. The Dutch are said to be prepared to reconsider their views of forced curtailment only if a well-founded scheme is forthcoming. On the contrary, it is believed that the big Dutch producers are still not in favor of restriction. It was noted on the market that both Dutch and British producers sold freely at the recent advances in prices."

In view of past experiences Dutch growers can hardly be blamed for being pessimistic about restriction schemes.

Still, the mere announcement of renewed negotiations sent the market up to a high of 8.30 cents for March, 1.10 cents above the recent low of 7.20 cents.

Most of this gain was nipped, however, when dealers took advantage of the step-up in prices and dumped some of their stocks on the market. March closed the week around the 8-cent level.

It was interesting to watch the market's reaction to the news about the restriction agreements. It was simply galvanized. It acted as if it had had a new monkey gland. Bearish statistics. If these statistics had been heeded, prices would probably still be around the 7½-cent level. But when the Malayan shipment figures were published, the market jumped 50 points.

Malayan shipments for February totaled 41,951 tons, of which 26,714 tons were to the United States and 8,796 tons to the United Kingdom. The total compares with 41,579 in January and 48,947 in February, 1930. Ceylon shipments for February were 6,341 tons, against 6,746 tons in January, and 8,011 a year ago.

Arrivals of rubber at New York in February were approximately 30,000 tons. The total for the entire country was about 36,000 tons; while consumption for the same month was about 28,000 tons.

Add to this list of bearish factors, another one in the form of an estimated increase of about 2,000 tons in the London and Liverpool stocks for the present week.

Prices at the close of March 7 on No. 1 Standard contract were:

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | .... | ... | 8.02/8.10 | 8.00/8.02 |
| Apr. | .... | ... | 8.11 | 8.08 |
| May | 8.25 | 8.20 | 8.20/8.25 | 8.17 |
| June | ... | ... | 8.28 | 8.25 |
| July | ... | ... | 8.37 | 8.33/8.34 |
| Aug. | ... | ... | 8.47 | 8.44 |
| Sept. | ... | ... | 8.57/8.62 | 8.54/8.55 |
| Oct. | ... | ... | 8.66 | 8.64 |
| Nov. | ... | ... | 8.76 | 8.74 |
| Dec. | 8.90 | 8.87 | 8.85/8.90 | 8.84/8.85 |
| Jan. | 8.90 | 8.90 | 8.95 | 8.94 |
| Feb. | ... | ... | 9.05 | 9.04 |
| Spot | ... | ... | 8.05 | 8.06 |

Week ended March 14. The market was up one day and down the next during the whole week. It was reacting to favorable and unfavorable reports of the meeting of Dutch and British growers who gathered to consider restriction. For the week, however, prices were down from 30 to 40 points.

Figures issued from the Far East did little to bolster confidence. Far Eastern dealers' stocks of rubber underwent a further slight increase during February. Dealers' holdings at the end of February totaled 44,105 tons, compared with 43,698 tons at the end of January, and 40,434 tons at the end of December. The increase was accounted for by ribbed smoked sheets, as stocks of other grades declined.

London and Liverpool are expected to show another increase in stocks for the week. This fact and the increase in dealers' stocks may lend weight to the restriction conferences. The reduction in production predicted these many months past has not materialized. Production costs apparently are much lower than they have been at any time; consequently outside influence seems necessary to effect curtailment.

**RUBBER EXCHANGE ACTIVITIES**

| Week Ended | Transactions: Contracts Sold Number | Tons | Transferable Notices | Week-End Tone |
|---|---|---|---|---|
| Feb. 28.. | 500 | 1,250.0 | 125 | Quiet and steady |
| Mar. 7.. | 609 | 1,522.5 | 34 | Steady |
| Mar. 14.. | 654 | 1,635.0 | 56 | Quiet |
| Mar. 21.. | 607 | 1,517.5 | 190 | Quiet and steady |
| Totals | 2,370 | 5,925.0 | 405* | |

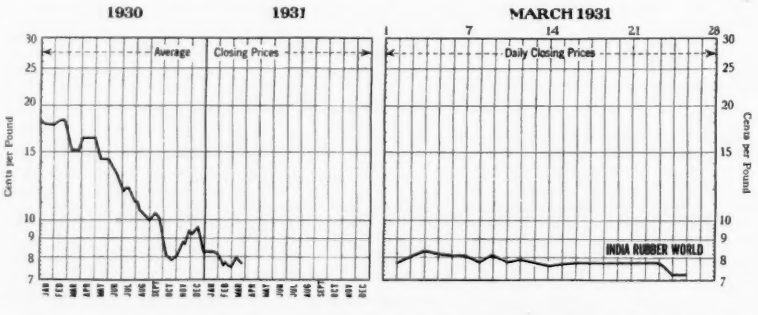
*Actual deliveries of rubber.

Prices on No. 1 Standard contract on March 14 were:

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | ... | ... | 7.60 | 7.75/7.80 |
| Apr. | ... | ... | 7.70 | 7.84 |
| May | 7.80 | 7.80 | 7.80 | 7.93/8.00 |
| June | ... | ... | 7.90 | 8.03 |
| July | 8.00 | 8.00 | 8.00 | 8.13/8.14 |
| Aug. | ... | ... | 8.10 | 8.21 |
| Sept. | 8.20 | 8.17 | 8.20 | 8.30 |
| Oct. | ... | ... | 8.30 | 8.41 |
| Nov. | ... | ... | 8.40 | 8.52 |
| Dec. | 8.50 | 8.50 | 8.48 | 8.65 |
| Jan. | ... | ... | 8.58 | 8.75 |
| Feb. | ... | ... | 8.68 | 8.85 |
| Spot | ... | ... | 7.70 | 7.82 |

Week ended March 21. Restriction news seems to be governing the market at the present time. News has not been favorable up to this time, but many are counting on an agreement of some sort to lift rubber out of the doldrums. The opponents of restriction are in favor of letting economic forces adjust the situation, but one authority points out that rubber seems to be unable to respond to economic forces.

Estimates of Malayan shipments for example, are put at 41,000 tons, practically the same as the high totals for January and February, which were 41,579 tons and




New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

## New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

| | February, 1931 | | | | | March, 1931 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23* | 24 | 25 | 26 | 27 | 28 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 17 | 18 | 19 | 20 | 21 |
| Ribbed Smoked Sheet | ... | 7¼ | 7⅝ | 7½ | 7⅝ | 7⅝ | 7¾ | 8 | 8⅜ | 8⅛ | 8 | 8 | 7¾ | 8⅛ | 7¾ | 7⅞ | 7¾ | 7⅝ | 7⅝ | 7¾ | 7¾ | 7¾ | 7⅝ | 7⅝ |
| No. 1 Thin Latex Crepe | ... | 7½ | 7⅞ | 7¾ | 7⅞ | 7⅞ | 8 | 8¼ | 8⅜ | 8⅜ | 8¼ | 8¼ | 8 | 8⅜ | 8 | 8⅛ | 8 | 7⅞ | 7⅞ | 8 | 8 | 8 | 7⅞ | 7⅞ |
| No. 1 Thick Latex Crepe | ... | 7¼ | 7⅝ | 7½ | 7⅝ | 7⅜ | 7¾ | 8 | 8⅜ | 8⅛ | 8 | 8 | 7¾ | 8⅛ | 7¾ | 7⅞ | 7¾ | 7⅜ | 7⅜ | 7¾ | 7¾ | 7¾ | 7⅝ | 7⅝ |
| No. 1 Brown Crepe | ... | 7⅛ | 7⅜ | 7⅜ | 7½ | 7½ | 7⅝ | 7⅞ | 8¼ | 8 | 7⅞ | 7⅞ | 7⅝ | 8 | 7⅝ | 7¾ | 7⅜ | 7½ | 7½ | 7⅝ | 7⅝ | 7⅜ | 7½ | 7½ |
| No. 2 Brown Crepe | ... | 7 | 7½ | 7¼ | 7¼ | 7⅜ | 7⅜ | 7⅝ | 8 | 7¾ | 7⅝ | 7⅝ | 7⅜ | 7¾ | 7⅜ | 7½ | 7⅜ | 7¼ | 7¼ | 7⅜ | 7⅜ | 7⅜ | 7¼ | 7¼ |
| No. 2 Amber | ... | 7⅛ | 7⅜ | 7⅜ | 7⅜ | 7½ | 7⅝ | 7⅞ | 8¼ | 8 | 7⅞ | 7⅞ | 7⅝ | 8 | 7⅝ | 7¾ | 7⅝ | 7½ | 7½ | 7⅝ | 7⅝ | 7⅝ | 7½ | 7½ |
| No. 3 Amber | ... | 7 | 7½ | 7¼ | 7½ | 7¼ | 7½ | 7¾ | 8⅛ | 7⅞ | 7¾ | 7¾ | 7½ | 7⅞ | 7½ | 7⅝ | 7½ | 7⅜ | 7⅜ | 7½ | 7½ | 7½ | 7⅜ | 7⅜ |
| No. 4 Amber | ... | 6⅝ | 7 | 7⅛ | 7⅛ | 7⅛ | 7¼ | 7½ | 7¾ | 7½ | 7½ | 7½ | 7¼ | 7⅝ | 7¼ | 7⅜ | 7¼ | 7⅛ | 7⅛ | 7¼ | 7¼ | 7¼ | 7¼ | 7¼ |
| Rolled Brown | ... | 6½ | 6⅞ | 7 | 7 | 7 | 7⅛ | 7⅜ | 7⅝ | 7⅜ | 7¼ | 7¼ | 7 | 7⅜ | 7 | 7⅛ | 7 | 6⅞ | 6⅞ | 7 | 7 | 7 | 7 | 7 |

*Holiday.

41,951 tons respectively. No evidence is here of economic correction of overproduction.

The Rubber Manufacturers Association report for the month of February was even more bearish than had been expected by traders, showing consumption of 28,797 tons against arrivals of 36,645 tons. Stocks on hand were 212,833 tons, and afloat 63,680 tons.

Inventories of pneumatic casings continue to decline. At the end of January, according to the Association's report, 8,957,307 casings were on hand, compared with 9,003,438 at the end of December.

Production of automobiles during February was estimated by the National Automobile Chamber of Commerce to be 230,364 units for the United States and Canada, compared with 178,309 in January and 345,955 in February, 1930. March production is estimated at about 275,000.

The market was all expectancy when a cable was received from Amsterdam saying that the Dutch Rubber Committee, after interviewing the Netherlands Colonial Minister, will leave Amsterdam for London on Friday. Upon their arrival the conference on a restriction plan for the rubber industry was to be resumed with the British growers, and French and Belgium producers were expected to participate. The cable claimed that there was every prospect of an understanding.

This bright prospect didn't remain bright for very long. On Thursday a cable was received saying that the London restriction conference between Dutch and British rubber interests, which was scheduled to get under way Friday after a two-week adjournment, has been put off for a few days.

This action was taken to mean by some that the Dutch had nothing definite to offer the British. The Dutch Government apparently is not in favor of cooperating in a restriction agreement for rubber, in spite of the fact that it has done so in sugar.

Prices at the close of March 21 on No. 1 Standard contract were:

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | ... | ... | 7.55 | 7.55 |
| Apr. | ... | ... | 7.60 | 7.64 |
| May | 7.80 | 7.75 | 7.80 | 7.74 |
| June | ... | ... | 7.87 | 7.81 |
| July | ... | ... | 7.95/7.98 | 7.88 |
| Aug. | ... | ... | 8.02 | 7.95 |
| Sept. | 8.12 | 8.10 | 8.10 | 8.05/8.06 |
| Oct. | ... | ... | 8.15 | 8.14 |
| Nov. | ... | ... | 8.27 | 8.23 |
| Dec. | 8.32 | 8.32 | 8.38 | 8.32/8.38 |
| Jan. | ... | ... | 8.48 | 8.43 |
| Feb. | ... | ... | 8.58 | 8.53 |
| Spot | ... | ... | 7.62 | 7.62 |

On March 23 trading was cautious and in a narrow range. Bear operators were cagy about forcing the market, and few contracts changed hands.

A report, later denied, that the rubber conference was off sent the market down from 5 to 20 points on March 24. The future positions suffered most when disappointed longs sold their rubber on receipt of the bearish news.

On March 25 the report of the previous day was verified. All conferences are off, for the large growers had withdrawn their support. Price dropped to new record lows of 7.10 cents.

March 26 sellers' prices were spot, 7¼ cents; May, 7⅜ cents; July-September, 7⅝ cents; and October, 8 cents. Very little buying interest was manifest.

## N. Y. Outside Market

Automobile figures seem to prove the assertion that most of the money received in the form of bonuses is being spent for new cars. February production of automobiles was the highest in six months, and 29 per cent over January. With the coming of Spring, of course, a seasonal increase is to be expected. While it is gratifying to know that sales are picking up, the February figure has not reached the figure for the same month in 1930. More cars are being sold, though, as evidenced by the estimated increase of about 9 per cent in automobile registrations for February. More tires are purchased at the same time, but not quite up to the 1930 figure.

Those troublesome increases of rubber stocks on hand have not stopped. Stocks here are at a new record high total, and stocks in London and Liverpool have gained every week during the month.

Prices held fairly steady during the month until the announcement was made that the conference between the Dutch and British growers had failed. Quotations then slumped to new record low levels of 7¼ cents.

The large growers withdrew their support entirely; this action means that economic forces must run their natural course. In the process many of the small producers will probably be forced into bankruptcy and abandonment of their estates.

Week ended February 28. Considering the record low levels reached by quotations on the Exchange, the prices of actuals were firm. Although talk had stand-

## New York Quotations

***Following are New York outside market rubber quotations for one year ago, one month ago, and Mar. 26, the current date***

| **Plantation Hevea** | March 25, 1930 | February 24, 1931 | March 26, 1931 |
|---|---|---|---|
| Rubber latex (Hevea) | $1.25 @ | $0.75 @ | $0.75 @ |
| **Sheet** | | | |
| Ribbed, smoked, spot | .15½@.15⅝ | .07½ @ | .07⅛@.07¼ |
| April-June | .16 @ | .07¾ @ | .07¼@.07⅜ |
| July-September | .16½@.16⅝ | .08 @ | .07½ @ |
| October-December | .17 @.17¼ | @ | .07¾@.08 |
| **CREPE** | | | |
| No. 1 Thin latex (first latex) spot | .15¾@.16 | .07¾@.08 | .07⅜@.07½ |
| April-June | .16⅜@.16½ | .08 @.08¼ | .07⅝@.07¾ |
| July-September | .17 @ | .08¼@.08½ | .07⅞@.08 |
| October-December | .17½@.17¾ | @ | .08⅛@.08¼ |
| No. 2 Amber, spot ("B" blanket) | .14½@ | .07⅛@.07⅜ | .07 @.07¼ |
| April-June | .15 @ | .07⅜@.07⅝ | .07¼@.07⅜ |
| July-September | .15½@ | .07⅝@.07¾ | .07⅜@.07½ |
| October-December | .16 @ | @ | .07⅝@.07¾ |
| No. 3 Amber, spot ("C" blanket) | .14¼@ | .07 @.07¼ | .06⅞@.07 |
| No. 1 Brown, clean light, thin | .14½@ | .07½@ | .07 @ |
| No. 2 Brown, clean, thin | .14¼@ | .06⅞@ | .06¾@.06⅞ |
| Brown, roll | .10¼@ | .06⅝@.06¾ | .06½@.06⅝ |
| **East Indian** | | | |
| **PONTIANAK** | | | |
| Banjermasin | .08 @ | .05 @ | .05 @ |
| Pressed block | .14 @ | .12 @ | .11 @ |
| Sarawak | .08 @ | .05 @ | .05 @ |
| **South American** | | | |
| **PARAS** | | | |
| Upriver, fine | .16½@ | .08¾@ | .08½@.08¾ |
| Upriver, fine | *.22 @ | *.11¾@ | *.11¾@ |
| Upriver, coarse | .08 @ | .05½@ | .05¼@.05½ |
| Upriver, coarse | *.14½@ | *.08¾@ | *.08¼@ |

| **South American** | March 25, 1930 | February 24, 1931 | March 26, 1931 |
|---|---|---|---|
| PARAS—*Continued* | | | |
| Islands, fine | $.15¾@ | $0.08½@ | $0.08¼@.08½ |
| Islands, fine | *.21½@ | *.11½@ | *.11½@ |
| Acre, Bolivian, fine | .17 @ | .08⅞@ | .08⅞@ |
| Acre, Bolivian, fine | *.22½@ | *.12 @ | *.12 @ |
| Beni, Bolivian | .17¼@ | .09 @ | .08¾@.09 |
| Madeira, fine | .16½@ | .08¾@ | .08½@.08¾ |
| **CAUCHO** | | | |
| Upper caucho ball | .08 @ | .05 @ | .05 @ |
| Upper caucho ball | *.14½@ | *.08¾@ | *.08¾@ |
| Lower caucho ball | .07½@ | .04¾@ | .04¾@ |
| **Manicobas** | | | |
| Ceará negro heads | †.19 @ | @ | @ |
| Ceará scrap | †.11 @ | @ | @ |
| Manicoba, 30% guaranteed | †.21 @ | †.05 @ | .06 @ |
| Mangabiera, thin sheet | †.21 @ | †.05 @ | .06 @ |
| **Guayule** | | | |
| Duro, washed and dried | .17 @ | .14 @ | .14 @ |
| Ampar | .18 @ | .15 @ | .15 @ |
| **Gutta Percha** | | | |
| Gutta Siak | .16 @ | .12½@ | .12 @ |
| Gutta Soh | @ | .24 @ | .20 @ |
| Red Macassar | 2.50 @ | 1.75 @ | 1.75 @ |
| **Balata** | | | |
| Block, Ciudad Bolivar | .43 @ | .29 @ | .30 @ |
| Colombia | .39 @ | @ | @ |
| Manos block | .41 @ | .33 @ | .33 @ |
| Surinam sheet | .54 @ | .56 @ | .55 @ |
| Amber | .56 @ | .58 @ | .58 @ |

* Washed and dried crepe. Shipment from Brazil.
† Nominal.

ard ribs sold at 7⅜ cents, little rubber was sold under 7½ cents. Ambers and browns changed little in price, remaining steady throughout the week.

Buying was limited. Manufacturers are well supplied, and 7¼-cent rubber is an old story for them. They are waiting for lower prices, although it was learned that factory interests had negotiated in London for monthly arrivals over the remainder of the year on a c. i. f. New York basis, at 4¾ pence per pound, which works out at around 9.64 cents. Aside from the statement that "fair quantities" had been purchased, no idea of the tonnage involved was obtainable, according to *The Journal of Commerce*.

Shipments from the Far East during January showed no abatement. Those from the larger estates declined, but the increase from the smaller estates offset the decline.

The Dutch shipment total was some 1,700 tons higher than in December, and the remaining shipments from Sumatra and Borneo, where native outputs dominate, showed surprisingly large increases in shipments both over December and January of last year.

With these facts facing it, the rubber situation looks like a cut-and-dried affair for some time to come. Automobile production is nothing extraordinary, and consumption is lagging far behind production. Native production seems to be one of the chief causes, and statistics from this source will be watched with keen interest for the next few months.

Prices at the close on February 28 were:

| Spot | Feb. 28 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe | 7⅜ | 8¼ | 16¾ |
| Ribs | 7⅜ | 7⅞ | 15¾ |
| Upriver fine | 9¼ | 10¾ | 16¾ |

Week ended March 7. The market stirred itself out of its lethargy and climbed over the 8-cent level to close the week near the 8¼-cent level, in spite of rather adverse factors.

Shipments from the Far East were higher, and British stocks continue to increase, but the actuals followed the Exchange market which had responded to reports of restriction meetings between Dutch and British growers.

So strong was the influence of the reported restriction efforts that the market moved upward in the face of all of them.

Prices at the close of March 7 were:

| Spot | Mar. 7 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe | 8¼ | 7⅞ | 15⅝ |
| Ribs | 8 | 7⅝ | 15¼ |
| Upriver fine | 9⅛ | 10¼ | 16½ |

Week ended March 14. Little buying was seen in the market, but prices were rather firm. Although quotations on the Exchange fluctuated widely, dealers in actuals held prices firm and refused to shave their quotations.

The increase in far eastern stocks in the hands of dealers was rather disappointing news, as was the estimate of an increase of about 2,000 tons in British stocks for the week.

Much talk went around about the latest efforts of British and Dutch growers to effect some sort of a restriction agreement, with opinion divided as to the desirability of artificial attempts to turn the economic balance in a favorable direction.

Dealers in Amsterdam do not seem to favor the idea because they think that it would not be effective. Costs are so low that rubber could be sold at 8 cents, the 10 per cent duty paid, and there would still be a margin of profit. Still, if stocks continue to pile up, we cannot be much worse off under a restriction scheme.

February production of automobiles, estimated from shipping reports, reached a total of 230,364 units, an increase of 29 per cent over January and the highest mark in six months. This increase was hailed as highly encouraging to the industry, as was the report that all indications pointed to a probable rise of 50 per cent in production this month. Retailers' reports from ten key cities indicate that sales were keeping step with production.

Prices at the close on March 14 were:

| Spot | Mar. 14 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe | 7⅝ | 8 | 15½ |
| Ribs | 7⅝ | 7¾ | 15 |
| Upriver fine | 9⅜ | 9¼ | 16½ |

Week ended March 21. Not much buying was done in physical rubber, but prices were held firm. That condition perhaps explains why the buying was curtailed. The Standard No. 1 contract was held rather rigidly around the 8-cent level.

The tendency was to await the outcome of the restriction conferences between the Dutch and the British. The meeting which was postponed on Friday may produce definite results when it is held in the next few days.

In reference to the market position we quote a member of the Exchange as follows: "We feel that manufacturers are safe in making commitments at these levels since a failure of a restriction agreement to materialize would at the most only depress prices 2 or 3 cents; whereas an enforceable agreement made would probably improve prices some 5 or 10 cents. From the speculative viewpoint the long side is the safest, but one must form his own opinion as to the outcome of the London negotiations; on the one side there is so much to be gained by all concerned, whereas the workings and enforcement of a restriction plan are so difficult to make satisfactory to all interests, and the disastrous results of the Stevenson Plan have not yet been forgotten."

February exports from the Dutch East Indies were 21,414 tons, compared with 23,978 tons during January.

Prices at the close on March 21 were:

| Spot | Mar. 21 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe | 7⅜ | 7⅝ | 15⅞ |
| Ribs | 7⅝ | 7⅜ | 15½ |
| Upriver fine | 9¼ | 9¼ | 16½ |

Prices were steady at 7¾ cents on March 23, but sold off ⅛-cent to 7⅝ cents on March 24. This was within ¼-cent of the record low, but trade and factory buyers showed very little interest. Failure of the Dutch and the British growers' conference on the 25th sent prices to a new low of 7¼ cents. This decline stimulated a mild and limited interest on the part of consumers willing to buy at around 7 cents for spot, and on March 26 sellers' price was 7¼ cents.

# Rubber Scrap

THE market for rubber scrap in March was noticeably better than in February. Scrap tire seemed to be scarcer, and consumption increased in activity. Scrap prices in general are fair. The slightly upward tendency in boots and shoes, inner tubes, and hard rubber is attributable both to increased export trade and to improved demand from reclaimers as their needs for stock replenishment gradually arise with the betterment of the rubber manufacturing industry. Dealers in rubber scrap anticipate good spring business. Collections of tire scrap in March were poor owing to severe weather. April collections will be larger because of milder weather.

Prices throughout the list are firm and with some advances, particularly in boots and shoes and tubes. All revisions were upward. Export trade was quiet.

BOOTS AND SHOES. These grades are in fairly active demand. Collections are slow and are not due for much improvement until mild spring weather arrives. Prices are still too low to permit sorting colored goods from black with profit; hence this work is passed on by the collectors to the dealers. All boot and shoe scrap, except tennis, which remains at 60 to 70 cents, have advanced 5 cents per 100 pounds.

INNER TUBES. Collections are scanty because of low prices. The movement of stock for domestic consumption is fair. The supply of floating tubes is approaching extinction. The scrap demand for them, however, is very good. Export business in No. 1 tubes is fair.

TIRES. Collections are light on pneumatic tires because of weather conditions. Prices are firm and unchanged.

Solid tires are scarcer, and a big export-demand has developed. The material is ground for compounding rather than reclaiming. Prices hold unchanged.

MECHANICALS. All grades of mechanical scrap are dull, with prices low.

HARD RUBBER. Supplies of this grade are not excessive. The prices have advanced ⅝-cent a pound, and are steady.

**CONSUMERS' BUYING PRICES**

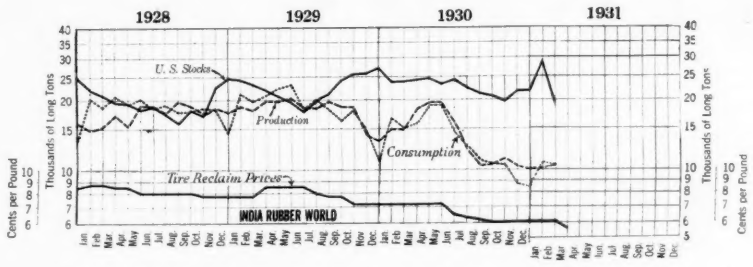
**Carload Lots**

**Delivered Eastern Mills**

March 26, 1931

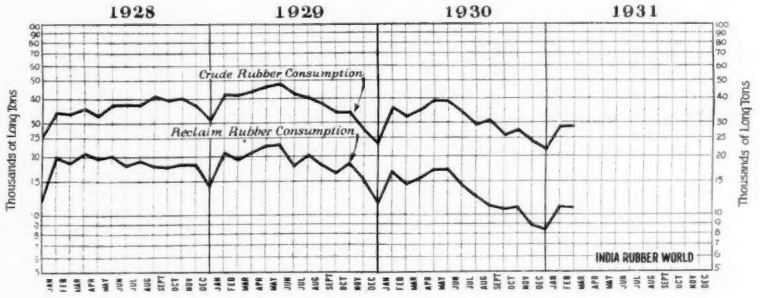
| | Prices |
|---|---|
| **Boots and Shoes** | |
| Boots and shoes, black..100 *lb.* | $1.10 @$1.15 |
| Untrimmed artics ....100 *lb.* | .75 @ .85 |
| **Tennis shoes and soles..100 *lb.*** | **.60 @ .70** |
| **Inner Tubes** | |
| **No. 1, floating .....*lb.*** | **.04¼@ .05** |
| No. 2 compound.....*lb.* | .022 @ .023 |
| Red .....*lb.* | .019 @ .0205 |
| Mixed tubes .....*lb.* | .02 @ .02⅛ |
| **Tires** | |
| **Pneumatic Standard** | |
| **Mixed auto tires with beads .....*ton*** | **11.50 @12.00** |
| Beadless .....*ton* | 16.00 @16.50 |
| **Auto tire carcass.....*ton*** | **17.00 @17.50** |
| **Black auto peelings....*ton*** | **20.00 @21.00** |
| **Solid** | |
| Clean mixed truck....*ton* | 28.00 "flat" |
| Light gravity .....*ton* | 33.00 @35.00 |
| **Mechanicals** | |
| Mixed black scrap.....*lb.* | .005⅝@ .00¾ |
| **Hose, air brake.....*ton*** | **11.00 @13.00** |
| **Garden, rubber covered..*lb.*** | **.00¾@ .00½** |
| **Steam and water, soft..*lb.*** | **.00¾@ .00½** |
| **No. 1 red .....*lb.*** | **.01⅞@ .02⅛** |
| **No. 2 red .....*lb.*** | **.01 @ .01⅜** |
| White druggists' sundries *lb.* | .01⅞@ .02⅛ |
| **Mechanical .....*lb.*** | **.01⅛@ .01¼** |
| **Hard Rubber** | |
| No. 1 hard rubber .....*lb.* | .08½@ .09¼ |

# Reclaimed Rubber




**Production, Consumption, Stocks, and Prices of Tire Reclaim**

THE gain in tonnage of reclaim consumed during January was reduced 200 tons in February. Production in February advanced about 400 tons over that in January and exactly balanced the February tonnage of consumption. A sharp decline in stocks of reclaim is recorded for February.




**Crude and Reclaimed Rubber Consumption**

The statistics of reclaim are tabulated and graphed on this page as usual. In addition a new graph is shown comparing the monthly consumption of crude with reclaim since January, 1928. The two curves are approximately parallel over the three-year period, but during the last half of 1930 the decline in consumption of reclaim was relatively more rapid than for crude. The consumption ratio of reclaim to crude is reported as for February was 37.5 per cent and for January 37.6 per cent.

At the prices quoted for reclaim grades for the past 6 to 8 months this material offers technical advantages over crude rubber from the point of view of economy. The ratio of reclaim to crude in certain lines of insulated wire and of cheap molded goods has been raised with great advantage. From some molded goods crude can be wholly eliminated with no disadvantage to practical service value or aging quality.

The chart comparing United States stocks, production and consumption of reclaim shows a sharp decline in February stocks, with production and consumption coinciding. Tire reclaim, which for 6 months was quoted at 6 cents a pound, dropped in March to 5¾ cents.

## United States Reclaimed Rubber Statistics—Long Tons

| Year | Production | Consumption | Consumption Per Cent to Crude | United States Stocks* | Exports |
|---|---|---|---|---|---|
| 1925 | 132,930 | 137,105 | 35.6 | 13,203 | 4,571 |
| 1926 | 180,582 | 164,500 | 45.9 | 23,218 | 5,391 |
| 1927 | 189,144 | 178,471 | 47.6 | 24,980 | 8,540 |
| 1928 | 208,516 | 223,000 | 50.4 | 24,785 | 9,577 |
| 1929 | 219,057 | 224,253 | 47.9 | 27,464 | 12,721 |
| 1930 | 157,967 | 153,497 | 41.5 | 24,008 | 9,468 |
| 1930 | | | | | |
| January | 13,902 | 15,766 | 45.8 | 24,241 | 954 |
| February | 14,676 | 14,012 | 45.5 | 24,241 | 1,203 |
| March | 16,115 | 14,669 | 43.2 | 24,415 | 1,048 |
| April | 16,511 | 16,269 | 43.0 | 24,592 | 740 |
| May | 16,496 | 16,411 | 43.7 | 23,356 | 939 |
| June | 14,581 | 13,534 | 41.6 | 24,484 | 641 |
| July | 11,411 | 11,918 | 42.3 | 22,477 | 778 |
| August | 11,158 | 11,321 | 35.9 | 21,636 | 807 |
| September | 10,588 | 10,787 | 41.4 | 20,704 | 656 |
| October | 11,437 | 11,038 | 39.3 | 19,912 | 572 |
| November | 10,895 | 9,075 | 37.5 | 22,000 | 437 |
| December | 10,197 | 8,697 | 39.3 | 22,000 | 693 |
| 1931 | | | | | |
| January | 10,460 | 11,003 | 37.6 | 20,466 | 649 |
| February | 10,871 | 10,800 | 37.5 | 18,878 | 625 |

* Stocks on hand the last of the month or year.
*Compiled by The Rubber Manufacturers Association, Inc.*

February quotations for standard reclaims are unchanged for most of the list, three grades only are changed. These are black auto tires at 5¾ to 6 cents, down ¼-cent; black selected tires 6 to 6½ cents, down ½-cent; and No. 2 tube reclaim, 7 to 7¼ cents, down ¼-cent.

Many unlisted reclaims are available at lower prices. They have their uses, but unquestionably they do not compare in economy or compounding value with the generally accepted standard grades. The price levels for reclaims of every grade are so advantageous to the rubber manufacturer that reclaimers are anticipating an increase of demand during the spring months.

## New York Quotations

March 26, 1931

| High Tensile | Spec. Grav. | Price Per Pound |
|---|---|---|
| Super-reclaim, black | 1.20 | $0.07½ @ $0.07¾ |
| red | 1.20 | .07 @ .07¼ |
| **Auto Tire** | | |
| Black | 1.21 | .05¼ @ .05¾ |
| Black selected tires | 1.18 | .05½ @ .06 |
| Dark gray | 1.35 | .07 @ .07½ |
| White | 1.40 | .08 @ .08½ |
| **Shoe** | | |
| Unwashed | 1.60 | .06 @ .06¼ |
| Washed | 1.50 | .07¼ @ .08 |
| **Tube** | | |
| No. 1 | 1.00 | .08¼ @ .08½ |
| No. 2 | 1.10 | .07 @ .07¼ |
| **Truck Tire** | | |
| Truck tire, heavy gravity | 1.55 | .06 @ .06¼ |
| Truck tire, light gravity | 1.40 | .06¼ @ .06½ |
| **Miscellaneous** | | |
| Mechanical blends | 1.60 | .05 @ .05¼ |

## Ratio of Reclaim to Crude

The ratio of reclaim consumption to crude rubber consumption during the last half of 1930 works out at 40.9 per cent against 40.7 per cent during the first half of the year. These percentages might be thought to indicate no reduction in the use of reclaims. It is in tires however, that the smallest percentage of reclaim is used—in times of low tire production the percentage use of reclaim normally increases. During the last half of 1930, it is believed that tire production was at a lower rate than production of other rubber goods as a whole, and this fact tended to hold up the percentage figure for reclaim. An increasing production of tires during 1930 would normally result in a lower percentage use of reclaim during the current year. It is nevertheless remarkable that reclaim should continue so strong a factor at the crude rubber price average of the last half of 1930, and it argues well for the worth of reclaims as essential compounds in the rubber manufacturing industry. Few would have predicted that reclaim would so nearly hold its own with the price of crude rubber under 10 cents a pound. Rubber Division, Department of Commerce, Washington, D. C.

# Compounding Ingredients

ACTIVITY in rubber goods manufacture in March showed little if any gain over that in February. Improvement in demand, however, is expected to appear in April because of the customary spring revival of industry and tire replacement purchasing by motorists. The March output of tires and tubes was practically at only 50 per cent of capacity. Some decline was reported in mechanical rubber goods production, heels, soles, and wire insulation. Footwear and weatherproof clothing plants were slack in March.

Buying of compounding ingredients in general is largely for current rather than for future needs.

ACCELERATORS. Ultra-accelerator types for rapid low temperaturing are gaining distinctly in favor for many important lines of rubber goods production conducted under controlled conditions of processing. Development is active along the line of producing ultra-accelerators of minimum scorching effect for safer processing. Something new in this field will soon be announced.

AGE RESISTERS. It is the aim of development of age resisters to combine in one material effective protection against deterioration by oxidation, fatigue, sun cracking, etc. Age resisters of these combinations are very desirable. Age resistant and acceleration effect are already available in certain popular accelerators. The compounder has a wide field for choice in the groups of age resisters already listed.

CARBON BLACK. Prices for this material are steady. During the first week of March some improvement in inquiry was noted. The general market features have remained unchanged since.

CLAY. A steady moderate demand and very low prices characterize the market for rubber compounding clay. No cheaper reenforcing material is available for general compounding.

LITHARGE. The price remains steady in spite of a reduction in the price of pig lead during the second week of March. The demand for litharge by the rubber trade is seasonal and routine.

LITHOPONE. The demand for lithopone is fair at unchanged prices.

RUBBER SOLVENTS. Prices have weakened, and some reduction in tank wagon prices became effective the third week in March.

SOFTENERS. Popular items in this convenient and varied group of ingredients are in steady demand. Prices for Degras are steady, and demand fair.

STABILIZERS. Demand is fair and steady. Prices for stearic acid remain steady.

ZINC OXIDE. Demand for standard rubber makers grades is fair at firm and unchanged prices.

## New York Quotations

**March 26, 1931**

**Prices Not Reported Will Be Supplied on Application**

| | | | |
|---|---|---|---|
| **Abrasives** | | | |
| Marble flour | ton | $20.00 | @$25.00 |
| Pumice stone, pwd. | lb. | .02½ | @ .04 |
| Rottenstone, domestic | ton | 23.50 | @ 28.00 |
| Rottenstone, English | lb. | .04 | @ .05 |
| Silica | lb. | .01¼ | @ .05 |
| **Accelerators, Inorganic** | | | |
| Lead, carbonate | lb. | | @ |
| red | lb. | | @ |
| sublimed blue | lb. | | @ |
| sublimed white | lb. | | @ |
| super-sublimed white | lb. | | @ |
| Lime flour, hydrated | ton | 20.00 | @35.00 |
| Litharge casks | lb. | | @ |
| Magnesia, calcined, heavy | lb. | .04 | @ |
| carbonate | lb. | .06 | @ .07 |
| Orange mineral A.A.A. | lb. | | @ |
| **Accelerators, Organic** | | | |
| **A-1** | lb. | .22 | @ .27 |
| **A-5-10** | lb. | .31 | @ .36 |
| A-7 | lb. | .55 | @ .65 |
| A-11 | lb. | .62 | @ .75 |
| **A-16** | lb. | .57 | @ .65 |
| **A-19** | lb. | .58 | @ .75 |
| **A-32** | lb. | .70 | @ .75 |
| Accelerator 49 | lb. | | @ |
| **Aldehyde ammonia** | lb. | .65 | @ .70 |
| Altax | lb. | | @ |
| **Barak** | lb. | | @ |
| **B. L. E.** | lb. | | @ |
| **Butene** | lb. | | @ |
| **Captax** | lb. | | @ |
| **Crylene** | lb. | | @ |
| paste | lb. | | @ |
| **D. B. A.** | lb. | | @ |
| Di-esterex N. | lb. | | @ |
| Di-ethyl-amine, 100% | lb. | | @ |
| **D. O. T. G.** | lb. | .42 | @ .44½ |
| **D. P. G.** | lb. | .30 | @ .32½ |
| **Ethylidine aniline** | lb. | .45 | @ .47½ |
| **Formaldehyde aniline** | lb. | .37½ | @ .40 |
| Grasselerator 808 | lb. | | @ |
| 833 | lb. | | @ |
| **Heptene** | lb. | | @ |
| base | lb. | | @ |
| **Hexamethylenetetramine** | lb. | .58½ | @ .61 |
| Hydrone | lb. | | @ |
| Lead oleate, No. 999 | lb. | .14 | @ |
| Witco | lb. | .15 | @ |
| **Lithex** | lb. | | @ |
| **Monex** | lb. | | @ |
| Novex | lb. | | @ |
| Phenex | lb. | .70 | @ .75 |
| **Pipsol** | lb. | 4.00 | @ 4.50 |
| **Plastone** | lb. | | @ |
| **R-2** | lb. | 1.75 | @ 2.15 |
| base | lb. | 4.50 | @ 5.00 |
| **R & H 40** | lb. | .40 | @ .42½ |
| 50 | lb. | .40 | @ .42½ |
| 397 | lb. | .75 | @ .77½ |
| Retardex | lb. | .50 | @ |
| **Safex** | lb. | | @ |
| **S-P-D-X** | lb. | .70 | @ .75 |
| Super-sulphur No. 1 | lb. | | @ |
| No. 2 | lb. | | @ |
| **Tensilac 39** | lb. | .40 | @ .42½ |
| Thermlo F | lb. | | @ |

| | | | |
|---|---|---|---|
| **Accelerators, Organic** *(Continued)* | | | |
| Thiocarbanilid | lb. | $0.21 | @$0.23 |
| T. M. T. T. | lb. | 3.00 | @ 3.25 |
| Trimene | lb. | | @ |
| base | lb. | | @ |
| **Triphenyl guanidine** | lb. | .58 | @ .60 |
| Tuads | lb. | | @ |
| Ulto | lb. | 3.00 | @ |
| Ureka | lb. | .70 | @ 1.00 |
| Z. B. X. | lb. | | @ |
| Z-88-P | lb. | .50 | @ .60 |
| Zimate | lb. | | @ |
| **Acids** | | | |
| Acetic 28% (bbls.) | 100 lbs | 2.60 | @ 2.85 |
| glacial (carboys) | 100 lbs. | 9.73 | @ 9.98 |
| **Sulphuric, 66°** | ton | 15.50 | @ |
| **Alkalies** | | | |
| Caustic soda, 76% solid | 100 lbs. | 3.44 | @ 3.59 |
| **Antioxidants** | | | |
| Age-Rite, powder | lb. | | @ |
| resin | lb. | | @ |
| white | lb. | | @ |
| Albasan | lb. | | @ |
| Antox | lb. | | @ |
| Oxynone | lb. | .68 | @ .90 |
| Resistox | lb. | .54 | @ .65 |
| Stabilite | lb. | .57 | @ .62 |
| Alba | lb. | .70 | @ .75 |
| V. G. B. | lb. | | @ |
| Zalba | lb. | | @ |
| **Antisun Materials** | | | |
| Heliozone | lb. | | @ |
| Sunproof | lb. | | @ |
| **Binders, Fibrous** | | | |
| Cotton flock, dark | lb. | .09 | @ .10 |
| dyed | lb. | .50 | @ .75 |
| white | lb. | .11 | @ .20 |
| **Colors** | | | |
| **BLACK** | | | |
| Bone | lb. | .07½ | @ |
| Carbon (see Reenforcers) | | | |
| Drop (bbls.) | lb. | .05½ | @ .15 |
| Lampblack (commercial) | lb. | .07 | @ .08 |
| **BLUE** | | | |
| Blue toners | lb. | .60 | @ 3.85 |
| Prussian | lb. | .35 | @ .37 |
| Ultramarine | lb. | .06 | @ .30 |
| **BROWN** | | | |
| Iron oxide | lb. | | @ |
| Mapico | lb. | .13½ | @ .14 |
| Sienna, Italian, raw | lb. | .05½ | @ .12½ |
| **GREEN** | | | |
| Chrome, light | lb. | .27 | @ .31 |
| medium | lb. | .28 | @ .31 |
| Chromium oxide | lb. | .24 | @ .30 |
| Green toners | lb. | 1.00 | @ 3.60 |
| **ORANGE** | | | |
| Cadmium sulphide | lb. | .65 | @ .75 |
| Orange toners | lb. | 1.40 | @ 1.60 |

| | | | |
|---|---|---|---|
| **Colors** *(Continued)* | | | |
| **ORCHID** | | | |
| Orchid toners | lb. | $1.05 | @$1.75 |
| **PINK** | | | |
| Pink toners | lb. | 1.00 | @ 1.80 |
| **PURPLE** | | | |
| Purple toners | lb. | .60 | @ 1.90 |
| **RED** | | | |
| Antimony | | | |
| Crimson, R. M. P. No. 3 | lb. | .48 | @ |
| Sulphur free | lb. | .52 | @ |
| 7-A | lb. | .35 | @ |
| Z-2 | lb. | .22 | @ |
| Cadmium | lb. | | @ |
| Iron Oxides | | | |
| bright pure domestic | lb. | .10 | @ .12 |
| bright pure English | lb. | .11 | @ |
| bright reduced English | lb. | .08 | @ |
| bright reduced domestic | lb. | .04 | @ .08 |
| Indian (maroon), pure domestic | lb. | .10 | @ |
| Indian (maroon), pure English | lb. | .09¾ | @ |
| Indian (maroon), reduced English | lb. | .08 | @ |
| Indian (maroon), reduced domestic | lb. | .03 | @ .07½ |
| Mapico | lb. | .08½ | @ .08¾ |
| **Oximony** | lb. | | @ |
| Red toners | lb. | .95 | @ 2.75 |
| **Rub-er-red** | lb. | .08¾ | @ |
| Spanish red oxide | lb. | .02¾ | @ .04 |
| Sunburnt red | lb. | .14 | @ |
| Venetian red | lb. | .01½ | @ |
| **WHITE** | | | |
| Lithopone | lb. | .04¾ | @ .05 |
| Albalith | lb. | .04½ | @ .05 |
| Azolith | lb. | .04½ | @ .05 |
| Cryptone | lb. | .06½ | @ .07 |
| Grasselli (50 lb. bags) | lb. | .04½ | @ .04¾ |
| (400 lb. bbls.) | lb. | .04¾ | @ .05 |
| Titanium oxide, pure | lb. | .20 | @ |
| Titanox "B" | lb. | .06½ | @ .07 |
| "C" | lb. | .07 | @ .07½ |
| Zinc Oxide | | | |
| AAA (lead free) | lb. | | @ |
| Azo (factory): | | | |
| ZZZ (lead free) | lb. | .06½ | @ .07 |
| ZZ (leaded) | lb. | .06¼ | @ .06¾ |
| Z (8% leaded) | lb. | .06¼ | @ .06¾ |
| Green seal | lb. | .10¾ | @ .10⅞ |
| Green seal, Anaconda | lb. | .10¾ | @ .10⅞ |
| Kadox, black label | lb. | .10¾ | @ .10⅞ |
| blue label | lb. | .09¾ | @ .09⅞ |
| red label | lb. | .08 | @ .08½ |
| Red seal | lb. | .09¾ | @ .09¾ |
| Red seal, Anaconda | lb. | .09¾ | @ .09⅞ |
| Special | lb. | .07 | @ .07½ |
| White seal (bbls.) | lb. | .11⅝ | @ .11⅞ |
| White seal, Anaconda | lb. | .11⅝ | @ .11⅞ |
| XX green | lb. | .07 | @ .07½ |
| XX red | lb. | .06½ | @ .07 |
| Zinc sulphide (bbls.) | lb. | .15 | @ .15¼ |

# New York Quotations

**March 26, 1931**

**Prices Not Reported Will Be Supplied on Application**

### Colors *(Continued)*

**YELLOW**

| | | | |
|---|---|---|---|
| Cadmium sulphide | lb. | @ | |
| Chrome | lb. | $0.16½ | @ |
| Mapico | lb. | .11 | @ .11½ |
| Ochre, domestic | lb. | .01¼ | @ .02½ |
| French | lb. | .03 | @ |
| Oxide, pure | lb. | .09 | @ |
| Zinc, C. P., imported | lb. | .21 | @ |

### Deodorant

| | | | |
|---|---|---|---|
| Rodo | lb. | | @ |

### Factice—See Rubber Substitutes

### Fillers, Inert

| | | | |
|---|---|---|---|
| Asbestine | ton | 13.40 | @14.50 |
| Baryta white (f.o.b. St. Louis, bbls.) | ton | 23.00 | @ |
| (f.o.b. St. Louis, 80 lb. paper bags) | ton | 22.20 | @ |
| Barytes, white, spot | ton | 30.00 | @40.00 |
| off color, spot | ton | 20.00 | @25.00 |
| Foam "A" (f.o.b. St. Louis) | ton | 23.00 | @ |
| Basofor | lb. | | @ |
| Blanc fixe, dry | lb. | .04½ | @ |
| pulp | ton | 42.50 | @45.00 |
| C-C-O white (f.o.b. St. Louis, bbls.) | ton | 15.00 | @ |
| Infusorial earth | ton | 45.00 | @50.00 |
| Slate flour, gray (fac'y) | ton | 6.00 | @ |
| Whiting | | | |
| Chalk, imported | 100 lbs. | .95 | @ 1.50 |
| Domestic | 100 lbs. | 1.00 | @ |
| Paris white, English cliffstone | 100 lbs. | 1.50 | @ 3.50 |
| Quaker | ton | | @ |
| Sussex | ton | | @ |
| Witco (l. c. l.) (f.o.b. New York) | ton | 20.00 | @ |
| Wood flour | ton | 25.00 | @ |

### Fillers for Pliability

| | | | |
|---|---|---|---|
| Flex | lb. | | @ |
| Fumonex | lb. | .02½ | @ .05 |
| P-33 | lb. | | @ |
| Thermax | lb. | | @ |
| Velvetex | lb. | .02 | @ .04 |

### Finishes

| | | | |
|---|---|---|---|
| Mica, amber | lb. | .04 | @ .05 |
| Shellac, fine orange | lb. | .60 | @ |
| Starch, corn, pwd. | 100 lbs. | 2.57 | @ 2.77 |
| potato | lb. | .05½ | @ .06½ |
| Talc, domestic | lb. | .01¼ | @ |
| dusting | lb. | .01¼ | @ .04 |
| French | ton | 18.00 | @22.00 |
| Italian | lb. | .03 | @ .05 |
| Pyrax A | ton | | @ |

### Inflating Material

| | | | |
|---|---|---|---|
| Ammonium carb., pwd. | lb. | .10 | @ |
| lump | lb. | .09½ | @ |
| Sponge paste | lb. | .30 | @ |

### Mineral Rubber

| | | | |
|---|---|---|---|
| Fluxrite (solid) | lb. | | @ |
| Genasco (fact'y) | ton | 40.00 | @42.00 |
| Gilsonite (fact'y) | ton | 37.14 | @39.65 |
| Granulated M. R. | ton | | @ |
| Hydrocarbon, hard | ton | | @ |
| Ohmlac Kapak, M. R. (f.o.b. fact'y) | ton | 60.00 | @ |
| M. 4 (f.o.b. fact'y) | ton | 175.00 | @ |
| Paradura (fact'y) | ton | 62.50 | @65.00 |
| Parmr Grade 1 | ton | 23.00 | @27.00 |
| Grade 2 | ton | 23.00 | @27.00 |
| Pioneer, M. R., solid (fact'y) | ton | 40.00 | @42.00 |
| M. R. granulated | ton | 50.00 | @52.00 |
| Robertson, M. R., solid (fact'y) | ton | 32.00 | @80.00 |
| M. R. granulated | ton | 35.00 | @80.00 |

### Mold Lubricants

| | | | |
|---|---|---|---|
| Rusco mold paste | lb. | .12 | @ .30 |
| Sericite | lb. | | @ |
| Soapbark (cut) | lb. | .08½ | @ .09 |
| Soapstone | ton | 15.60 | @22.00 |

### Oils

| | | | |
|---|---|---|---|
| Castor, blown, drums | lb. | .14 | @ |
| Kerosene | gal. | .10 | @ |
| Mineral | gal. | .20 | @ |
| Poppy seed oil | gal. | 1.70 | @ |
| Rapeseed | gal. | .71 | @ .74 |
| Red oil, distilled | lb. | .08⅜ | @ .08⅞ |
| Rubber process | gal. | .25 | @ |
| Spindle | gal. | .30 | @ |

### Protective Colloids

| | | | |
|---|---|---|---|
| Bentonite (dispersion clay) | lb. | .02½ | @ .03 |
| Casein, domestic | lb. | .08 | @ .08½ |

### Reenforcers

| | | | |
|---|---|---|---|
| Aluminum flake (sacks, c. l.) | ton | $21.85 | @ |
| (sacks, l.c.l.) | ton | 24.50 | @ |
| Carbon Black | | | |
| Aerfloted arrow | lb. | .03½ | @ .07 |
| Cabot's certified black | lb. | .03 | @ |
| Century (works, La., c. l.) | 100 lbs. | 3.50 | @ |
| Disperso (works, La., c. l.) | 100 lbs. | 3.50 | @ |
| Excello | lb. | .03 | @ |
| Gastex (f. o. b. fact'y) | | | |
| contracts | lb. | .02½ | @ |
| carload | lb. | .03 | @ |
| less carload | lb. | .03¾ | @ .04¼ |
| Micronex | lb. | .04 | @ .08 |
| Ordinary (compressed or uncompressed) | lb. | .03½ | @ .07 |
| Palmer gas black | lb. | .03 | @ |
| Supreme | lb. | .03 | @ |
| Clays | | | |
| Bento | lb. | .03 | @ |
| Blue Ridge, dark | ton | | @ |
| China | lb. | .01¼ | @ |
| Dixie | ton | | @ |
| Dusto | lb. | .07 | @ |
| Langford | ton | | @ |
| Lexo (works) | ton | 8.00 | @ |
| Par | ton | | @ |
| Perfection | ton | 20.00 | @ |
| Suprex No. 1 | ton | 8.00 | @ |
| No. 2, dark | ton | 6.50 | @ |
| White, extra light | ton | 70.00 | @ 80.00 |

## Sanitary Flooring

AN EASILY installed, durable, economical, and fire-proof floor for interiors that can be laid in plastic form over practically any foundation, is particularly desirable for floors in factory wash rooms, laboratories, and similar places. A composition flooring of these characteristics is shipped in bags in two parts, a powder and crystals. Liquid is made of the latter to mix the powdered ingredients. The plastic mass will begin to thicken in a few hours, and it is then brought to a smooth even finish by the use of a trowel. In 24 hours after laying, the material will be hard enough to withstand severe usage. Imperial Floor Co., Rochester, N. Y.

## Bull Dog Rug Gripper

SMALL rugs scattered on highly polished floors add a distinctive note to the decorations of the room, but often the rugs may prove a source of annoyance and accidents—unless some means are adopted to keep them from slipping. With this thought in mind the Boston Woven Hose & Rubber Co., Cambridge, Mass., designed the Bull Dog Rug Gripper.

This gripper is made of tough, strong fabric with a specially prepared non-skid surface which goes next to the floor and grips even the most energetically waxed surface. The material comes in rolls 54 inches wide and may be cut to any length. All that is necessary is to cut the rug gripper a trifle smaller all around than the rug, lay the former on the floor, friction side down, and place the rug on top of the gripper.

The manufacturer states that this device will not mar any floor. Romping children, carpet sweepers, vacuum cleaners, and any other pressure applied to the rug do not move the gripper, which is promised long wear.

### Reenforcers *(Continued)*

| | | | |
|---|---|---|---|
| Glue, high grade | lb. | $0.27 | @$0.35 |

### Rubber Substitutes or Factice

| | | | |
|---|---|---|---|
| Amberex | lb. | .15 | @ |
| Black | lb. | .07 | @ .12 |
| Brown | lb. | .06 | @ .13 |
| Thiokol | lb. | .30 | @ |
| White | lb. | .09 | @ .15 |

### Softeners

| | | | |
|---|---|---|---|
| Burgundy pitch | 100 lbs. | 6.00 | @ |
| Atlas | 100 lbs. | 6.50 | @ |
| Corn oil, crude | lb. | .09 | @ |
| Cottonseed oil (P. S. Y.) | lb. | | @ |
| Cycline oil | lb. | .25 | @ .34 |
| Degras | lb. | .04 | @ .04½ |
| Fluxol | ton | 18.00 | @80.00 |
| Fluxrite (fluid) | lb. | | @ |
| Palm oil (Lagos) | lb. | .05 | @ .05½ |
| (Niger) | lb. | .04¾ | @ .04⅞ |
| (Witco) | lb. | .05½ | @ |
| Para-flux | gal. | .15 | @ .17 |
| Petrolatum, snow white | lb. | .08 | @ .08½ |
| Pigmentar | gal. | .18 | @ .23 |
| Pigmentaroil (tank cars, factory) | gal. | .18 | @ |
| (bbls., drums) | gal. | .23 | @ |
| Pine oil, dest distilled | gal. | .54 | @ .55 |
| Pine pitch | bbl. | 4.50 | @ 8.00 |
| Pine tar (retort) | gal. | .23 | @ .25 |
| Rosin K (280 lbs.) | bbl. | 6.50 | @ |
| Rosin oil, compounded | gal. | .35 | @ |
| No. 3, deodorized | gal. | .57 | @ |
| No. 556, deodorized | gal. | .48 | @ |
| Rubberseed, drums | lb. | .09 | @ .09½ |
| Rubtack | lb. | .08 | @ |
| Tackol | lb. | .09 | @ .18 |
| Tonox | lb. | | @ |
| Witco No. 20 | gal. | .08 | @ |
| Woburn oil | lb. | .05½ | @ |
| Wobonite No. 94 | lb. | .03½ | @ |

### Solvents

| | | | |
|---|---|---|---|
| Benzol (90% drums) | gal. | .25 | @ |
| Carbon bisulphide (drums) | lb. | .05½ | @ .12 |
| tetrachloride (drums) | lb. | .06½ | @ .07 |
| Dip-Sol | gal. | | @ |
| Dryolene, No. 9 | gal. | | @ |
| Gasoline | | | |
| No. 303 | | | |
| Drums, (c. l.) | gal. | .20 | @ |
| Tank cars | gal. | .16 | @ |
| Petrobenzol | gal. | | @ |
| Rub-Sol | gal. | | @ |
| Solvent naphtha (tanks) | gal. | .25 | @ |
| Stod-Sol | gal. | | @ |
| Troluoil | gal. | | @ |
| Turpentine, Venice | lb. | .20 | @ |
| dest distilled | gal. | .35 | @ |

### Stabilizers

| | | | |
|---|---|---|---|
| Laurex, ton lots | lb. | | @ |
| Sta-Tex A | lb. | | @ |
| Stearates | | | |
| Aluminum | lb. | .26 | @ .27 |
| Calcium | lb. | .26 | @ .27 |
| Magnesium | lb. | .28 | @ .29 |
| Zinc | lb. | .27 | @ .28 |
| Stearex-B | lb. | .09 | @ .13 |
| Stearex flake | lb. | .09 | @ .13 |
| Stearic acid, dbl. pres'd. | lb. | .09 | @ .09½ |

### Vulcanizing Ingredients

| | | | |
|---|---|---|---|
| Sulphur | | | |
| Rubber sulphur | 100 lbs. | | @ |
| Soft rubber (c.l.) | 100 lbs. | | @ |
| (l.c.l.) | 100 lbs. | | @ |
| Sulphur chloride | lb. | .03½ | @ .04 |
| Superfine commercial flour (bbls.) | 100 lbs. | 2.55 | @ 3.10 |
| (bags) | 100 lbs. | 2.20 | @ 2.80 |
| Tire brand, superfine, | 100 lbs. | 1.75 | @ |
| Tube brand, velvet | 100 lbs. | 2.30 | @ |
| Velvet flour (240 lb. bbls.) | 100 lbs. | 2.95 | @ 3.50 |
| (150 lb. bags) | 100 lbs. | 2.60 | @ 3.15 |
| Telloy | lb. | | @ |
| Vandex | lb. | | @ |

(See also Colors—Antimony)

### Waxes

| | | | |
|---|---|---|---|
| Beeswax, white, com. | lb. | .55 | @ |
| carnauba | lb. | .33 | @ |
| ceresin, white | lb. | .12½ | @ |
| montan | lb. | .06½ | @ |
| ozokerite, black | lb. | .28 | @ |
| green | lb. | .28 | @ |
| Paraffin | | | |
| 122/124, crude, white scale | lb. | .03¼ | @ |
| 124/126 crude, white scale | lb. | .03¼ | @ |
| 125/127 fully refined | lb. | .04¼ | @ |

# Cotton and Fabrics

STATISTICS appearing during the month were for the most part bearish. Large stocks on hand, small consumption rate, and doubt as to whether a substantial cut in acreage will be effected, tended to hold back the market.

Nor did the announcement of the Farm Board toward the end of the month help matters. The board is withdrawing its support from the wheat market and may do the same for cotton. In fact, it has announced that it will not buy any of the 1931 crop to stabilize cotton prices.

Exports have fallen off extensively, and mills are not buying near so much cotton as they bought last season. The weather has been fine, and farmers are planting as rapidly as possible. No extended effort seems to be in evidence for reducing acreage, but it is pointed out that fertilizer sales have dropped materially; and because of the mild winter weather, there will probably be a large emergence of weevils.

A cheering sign appears on the horizon, however, and it comes from the textile manufacturers. Mills are approaching full time production; stocks on their shelves are extremely low; and back orders are increasing.

So definite are the signs of improvement from this quarter that *The New York Times* called attention to conditions in a small front-page article. A large mill in Manchester, N. H., is faced with a shortage of certain classes of textile workers and for the first time in several years was forced to advertise for operatives, says the article.

It goes on to say that, "From all sections of the State word has come that the textile industry is showing definite signs of improvement."

Week ended February 28. In response to a statement from the New York Cotton Exchange Service to the effect that cloth sales by cotton mills have so far exceeded production in the last few weeks that many mills are in a stronger position as to stocks and orders than at any other time since the Spring of 1927, prices rose from 23 to 29 points. These prices, reached on Tuesday, were the highest prices for the year.

But when sales by the cooperatives became heavy on the next day, cotton prices dropped from the record high levels. They were steady for a day or two; but when Liverpool weakened on Friday, the market here dropped from 8 to 11 points. This drop was smaller than that in Liverpool partly because of the strength on the stock market.

On Saturday the stock market turned downward, and disappointing cables from abroad sent cotton down about 6 points. A bad break in Alexandria sent cotton off from 95 to 110 points on sakels and 53 to 70 points on uppers.

*The Chronicle* put the world's visible supply of all kinds at 9,958,201 bales, against 7,853,687 last year. This figure includes 7,381,201 American, against 5,149,697 last year.

**COTTON BULL POINTS**

1. The weevil menace is expected to be widespread because of the mild winter.
2. Final figures on the 1930 crop showed total ginnings to be 13,753,883 running bales, compared with 14,547,791 for 1929, and 14,296,549 for 1928.
3. The Textile Merchants Association reported sales in February to be 154 per cent of the mill output; shipments aggregated 117 per cent of production; stocks at the end of the month showed a decrease of 10.2 per cent; while unfilled orders increased 14.7 per cent.
4. Employment is picking up in the textile field.

**COTTON BEAR POINTS**

1. Exports this season are over 280,000 bales behind those of a year ago.
2. Mills have taken a little over 2,000,000 bales less cotton than a year ago, and over 3,200,000 less than two years ago.
3. All disastrous soil effects of the drought seem to have disappeared, and a large reduction in acreage is hardly likely.
4. British Board of Trade reports that exports of yarns in February dropped to 9,000,000 pounds compared with 12,000,000 in the same month last year; cloth exports were 140,000,000 square yards, compared with 300,000,000 last year.
5. Consumption of foreign cotton for the first six months of the season exceeded that of American cotton by a small margin.
6. World supply of American cotton this season will be about 19,900,000 bales; consumption so far, for the first seven months, will be between 11,000,000 and 12,000,000 bales.
7. The cotton spinning industry operated during February at 87.2 per cent capacity on a single shift basis, compared with 97.7 per cent during February last year.

An estimate on Friday by the Fossick Bureau put the reduction in planting of cotton this year at 15.1 per cent from the 45,815,000 acres planted last year. Larger and smaller estimates have been given; but a bulletin from the Department of Agriculture might be significant.

This report declared that early estimates for the 1930 cotton crop in some important foreign countries were slightly too high according to the latest production and ginning reports received from these countries. Exports are estimated at the end of January to be about 412,000 bales below the same period last year.

Prices at the close of February 28 were:

| Position | High | Low | Previous Close |
|---|---|---|---|
| Mar. | 11.13 | 11.02 | 11.06 |
| May | 11.37 | 11.23 | 11.29 |
| July | 11.61 | 11.46 | 11.52 |
| Oct. | 11.88 | 11.74 | 11.79 |
| Dec. | 12.06 | 11.92 | 11.99 |
| Jan. | 12.12 | 12.02 | 12.06/07 |

Week ended March 7. President Hoover has accepted the resignation of Alexander Legge, chairman of the Federal Farm Board. Mr. Legge visited the President on Thursday, and the announcement of his resignation was made after the meeting. On the same day Mr. Legge expressed his opinions of the cut in cotton acreage.

"Cotton farmers are not taking action fast enough," he said. "There is too much of a disposition to let the other fellow do it."

The ex-chairman also believes that if the cotton farmers raise as much this year as they have been raising, "the price of cotton will be lower than it has ever been yet."

From what Southern correspondents have to say it appears that the most that can be expected in respect to reduction is a cut of about 8½ per cent. To be of any benefit the reduction should be from 15 to 20 per cent.

Gray goods sales were strong, and the report of the Association of Textile Merchants of New York was entirely bullish in characater.

"Evidence continues to pile up," according to a recent bulletin of the association, "that a permanent improvement has manifested itself in the cotton textile industry. The time has passed when cotton goods can be had on a write-your-own-ticket basis. . . . .

"The reports so far received covering sales in February tell an encouraging story of continued activity. . . . . In addition to a drastic reduction in total stocks, unfilled orders will probably exceed stocks at the end of February. Already in many constructions spot deliveries are unobtainable."

The disappointing acreage reduction predictions somewhat offset this favorable report. Prices for the week receded from 15 to 20 points. Before Mr. Legge's report March had climbed to 11.25 cents, and January to 12.30 cents, high records for the season.

Prices at the close of March 7 were:

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | 10.93 | 10.85 | 10.93 | 10.97 |
| May | 11.16 | 11.05 | 11.15/16 | 11.21/22 |
| July | 11.40 | 11.30 | 11.38/39 | 11.44/46 |
| Oct. | 11.66 | 11.57 | 11.66 | 11.73 |
| Dec. | 11.88 | 11.79 | 11.88 | 11.93 |
| Jan. | 11.95 | 11.89 | 11.95 | 12.01 |

Week ended March 14. Reports during this week were rather conflicting, and the market acted in most cases contrary to the reports. On Monday, for instance, when the bullish cloth figures were released, the market declined. The next day saw active buying, but the market declined again. Yet on Saturday, when the Census Bureau issued the bearish consumption figures, the market showed almost no change from the previous day. It had probably anticipated the figures; for the decline for the whole week was from 15 to 20 points.

The standard cloth statistics showed that sales for the four weeks in February had exceeded production by 54 per cent, with a decrease of 10.2 per cent in stocks on hand and an increase of 24.7 per cent in unfilled orders.

The Census Bureau reported that cotton consumed during February was 433,510 bales of lint and 55,087 bales of linters, compared with 454,188 of lint and 49,346 of linters in January this year and 494,396 of lint and 61,108 of linters in February last year.

Cotton spindles active during February numbered 25,763,408, compared with 25,611,458 in January this year and 28,920,162 in February last year.

Exports for February totaled 432,996 bales of lint, compared with 532,821 in January this year, and 402,074 in February last year.

A topic which is causing some apprehension at this time is acreage reduction. The general opinion is that a sharp reduction is necessary, but recent estimates have been much lower than those made a few weeks ago. Few go higher than 10 per cent; whereas it was at first conceded that 15 per cent of the acreage would be cut.

The world consumption figures of American cotton were more bearish than expected, being 5,278,000 bales, compared with 5,940,000 for the previous six months.

Prices at the close of March 14 were:

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | 10.65 | 10.58 | 10.65 | 10.63 |
| May | 10.85 | 10.79 | 10.83/85 | 10.82/83 |
| July | 11.09 | 11.02 | 11.07/08 | 11.05/08 |
| Oct. | 11.41 | 11.36 | 11.40/41 | 11.41 |
| Dec. | 11.61 | 11.56 | 11.60 | 11.60/61 |
| Jan. | 11.68 | 11.63 | 11.65 | 11.67 |

Week ended March 21. Gains of about 20 points were scored by the market for the week, but a more significant indication of its course may be obtained from the fact that on Friday, when the Census Bureau published a bullish ginnings report, the market lost 7 to 11 points.

Final official figures were 313,000 bales below previous reports. Total ginnings were 13,929,941 equivalent 500-pound bales, compared with 14,824,861 bales for the 1929 crop, and 14,477,974 bales for 1928.

Total ginnings in running bales were 13,753,883, compared with 14,547,791 for 1929, and 14,296,549 for 1928. Included were 78,188 bales of the crop of 1930 ginned prior to August 1, which was counted in the supply for the 1929-30 season, compared with 86,974 and 88,761 values of the crops of 1929 and 1928.

Production of 13,754,000 bales in the 1930 crop, running count, with a carryover of 6,187,000 bales on July 31, according to estimates of the Cotton Exchange Service, makes the world supply of American cotton this season 19,941,000 bales. Consumption estimates ranged from 11,000,000 to 12,000,000 bales for the first seven months of the season.

**WEEKLY AVERAGE PRICES OF MIDDLING COTTON**

| Week Ended | Cents per Pound |
|---|---|
| Feb. 28 | 11.25 |
| Mar. 7 | 11.17 |
| Mar. 14 | 10.80 |
| Mar. 21 | 10.91 |

No improvement has been seen in the consumption of cotton by the mills. So far they have taken 2,071,000 bales less this season than they did a year ago, and 3,231,000 below the total two years ago.

Another slightly favorable report was issued on Saturday when the Census Bureau released figures in reference to the cotton spinning industry. The industry operated during February at 87.2 per cent capacity, on a single shift basis, compared with 80 per cent during January this year and 97.7 per cent during February last year. Although the figure compares well with January's figure, it is almost time that statistics showed up better in comparison with last year's figures.

Prices at the close of March 21 were:

| Position | High | Low | Close | Previous Close |
|---|---|---|---|---|
| Mar. | 10.89 | 10.82 | 10.89 | 10.78 |
| May | 11.02 | 10.94 | 11.01/02 | 10.90/91 |
| July | 11.27 | 11.18 | 11.26/27 | 11.14/16 |
| Oct. | 11.58 | 11.50 | 11.57/58 | 11.47/48 |
| Dec. | 11.80 | 11.72 | 11.80 | 11.69 |
| Jan. | 11.89 | 11.80 | 11.89 | 11.76/77 |

On March 23 the Farm Board announced that it would end its stabilizing activities in wheat. Fearing similar action, apparently, the cotton market sold off from 17 to 23 points on the news. Professional sellers came into the market as mill buying declined.

The loss was extended for the greater part of the next day. May delivery reached 10.70 cents, a decline of 12 points, and a drop of 95 points from the recent high. But consumers were attracted by the low prices, and shorts were driven to cover in the final hour. May closed at 10.84 cents.

Sales on March 24 and 25 sent cotton to the lowest in six weeks, and the decline brought consumers into the market. Spot middlings in New York were quiet and unchanged at 10.8 cents on March 26.

### Cotton Fabrics

A well-known authority recently said that the volume of cotton cloth sales since January 1 has been heavier than during the same period in any recent year and has changed the industry's position.

DUCKS, DRILLS, AND OSNABURGS. The March trade in these fabrics kept pace with that in February, which registered a distinct improvement over January. No quotable change in prices took place. The outlook is for firmer prices and generally improved trade prospects. Output of the mills is curtailed, but stocks are considered ample.

RAINCOAT FABRICS. Raincoat manufacturers are buying sample yardages only for making up new spring models. The demand for fabrics is due to begin very shortly.

SHEETINGS. Business for the first quarter ran considerably in excess of the corresponding period of 1930. The only distracting feature is that most of the improvement in business is in print cloths but none whatsoever in sheetings. Sheetings today are very close to the bottom, and the spread between raw cotton and sheeting poundage prices has narrowed to the point where there is no profit in sales on today's market.

TIRE FABRICS. A slight improvement is noted in the demand for fabric for delivery over the next three months. In a few instances buyers have been tempted by the present low price levels to place moderate commitments throughout the balance of the year, but the volume of business is still far below normal.

## New York Quotations

**March 26, 1931**

### Drills

| | | |
|---|---|---|
| 38-inch 2.00-yard | *yard* | $0.11½ @ |
| 40-inch 3.47-yard | | .06⅞ @ |
| 50-inch 1.52-yard | | .15½ @ |
| 52-inch 1.90-yard | | .12⅜ @ |
| 52-inch 2.20-yard | | .10¾ @ |
| 52-inch 1.85-yard | | .12¾ @ |

### Ducks

| | | |
|---|---|---|
| 38-inch 2.00-yd D. F. | *yard* | .11⅝ @ |
| 40-inch 1.45-yard S. F. | | .15½ @ |
| 72-inch 1.05-yard D. F. | | .24¼ @ |
| 72-inch 16.66-ounce | | .25½ @ |
| 72-inch 17.21-ounce | | .26⅜ @ |

**MECHANICAL**

| | | |
|---|---|---|
| Hose and belting | *pound* | .24 @ |

**TENNIS**

| | | |
|---|---|---|
| 52-inch 1.35 yard | *yard* | .17¾ @ |

### Hollands

**RED SEAL**

| | | |
|---|---|---|
| 36-inch | *yard* | .12¾ @ |
| 40-inch | | .13¾ @ |
| 50-inch | | .19¼ @ |

**GOLD SEAL**

| | | |
|---|---|---|
| 40-inch, No. 72 | *yard* | .16¼ @ |

### Osnaburgs

| | | |
|---|---|---|
| 40-inch 2.35-yard | *yard* | $0.10 @ |
| 40-inch 2.48-yard | | .09½ @ |
| 40-inch 3.00-yard | | .07⅞ @ |
| 40-inch 10-oz. part waste | | .11 @ |
| 40-inch 7-oz. part waste | | .07½ @ |
| 37-inch 2.42-yard | | .09½ @ |

### Raincoat Fabrics

**COTTON**

| | | |
|---|---|---|
| Bombazine 64 x 60 | *yard* | .10¼ @ |
| Bombazine 60 x 48 | | .09¼ @ |
| Plaids 60 x 48 | | .11 @ |
| Plaids 48 x 48 | | .10 @ |
| Surface prints 64 x 60 | | .12 @ |
| Surface prints 60 x 48 | | .11 @ |
| Print cloth, 38½-in., 60 x 48 | | .04½ @ |
| Print cloth, 38½-in., 64 x 60 | | .05¾ @ |

### Sheetings, 40-inch

| | | |
|---|---|---|
| 48 x 48, 2.50-yard | *yard* | .07½ @ |
| 48 x 48, 2.85-yard | | .06¾ @ |
| 64 x 68, 3.15-yard | | .07⅝ @ |
| 56 x 60, 3.60-yard | | .06½ @ |
| 44 x 48, 3.75-yard | | .05½ @ |
| 44 x 40, 4.25-yard | | .05¾ @ |

### Sheetings, 36-inch

| | | |
|---|---|---|
| 48 x 48, 5.00-yard | *yard* | .04¾ @ |
| 44 x 40, 6.15-yard | | .04 @ |

### Tire Fabrics

**SQUARE WOVEN 17¼-ounce**

| | | |
|---|---|---|
| Peeler, karded | *pound* | $0.31 @ |

**BUILDER 23/11**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .31 @ |

**BUILDER 10/5**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .26 @ |

**CORD 23/5/3**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .31 @ |

**CORD 23/4/3**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .33 @ |

**CORD 23/3/3**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .36 @ |

**CORD 15/3/5**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .29 @ |

**CORD 13/3/3**

| | | |
|---|---|---|
| Peeler, karded | *pound* | .28 @ |

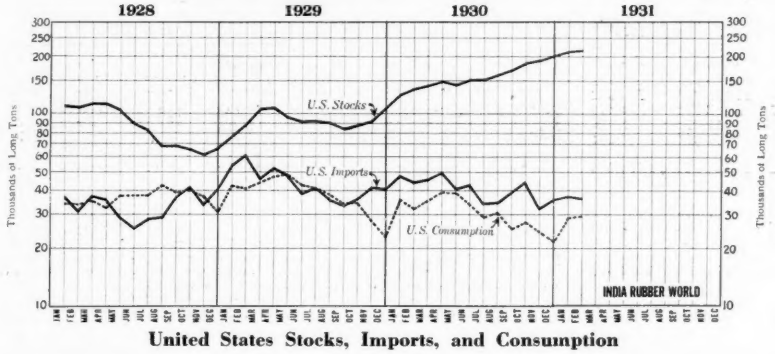
**LENO BREAKER**

| | | |
|---|---|---|
| 8-oz. Peeler, karded | *pound* | .31 @ |
| 10-oz. Peeler, karded | | .31 @ |

**CHAFER**

| | | |
|---|---|---|
| 9.5 oz. Peeler, karded | *pound* | .33 @ |
| 12-oz. Peeler, karded | | .32 @ |
| 14-oz. Peeler, karded | | .31 @ |

# Imports, Consumption, and Stocks



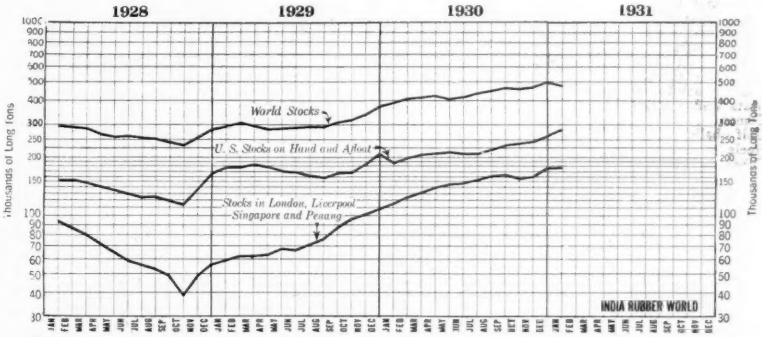

**United States Stocks, Imports, and Consumption**

WORLD stocks of crude rubber showed a distinct decline during January, but not sufficient to bring them to the level of November 30, 1930.

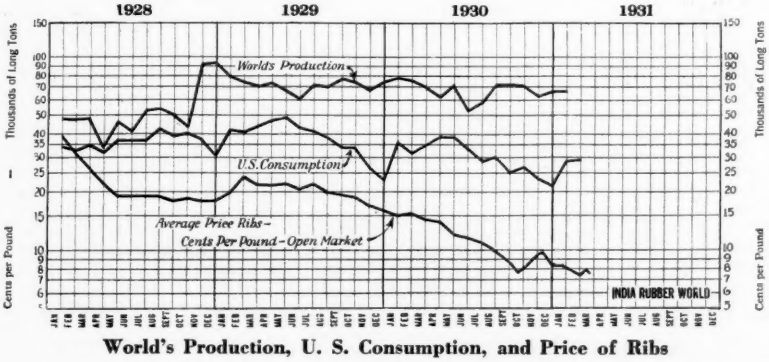
United States stocks on hand and afloat rose sharply by approximately 10,000 tons. The increase of these domestic stocks in the 12-month period from February 1, 1930, to February 1, 1931, was 77,744 tons.

Stocks in London, Liverpool, Singapore, and Penang at the close of January were 174,258 tons, an increase in the 12-month period from January 31, 1930, of 59,490 tons.

Consumption of crude rubber by manufacturers in the United States for the month of February is estimated to be 28,797 long tons, an increase of less than 1 per cent over the January consumption of 28,557 long tons, but counter to the usual seasonal decrease of 4 per cent, according to statistics compiled by The Rubber Manufacturers Association. Imports of crude rubber for February amounted to 36,645 long tons, as compared with 37,098 long tons for January. The Association estimates total domestic stocks of crude rubber on hand and in transit overland on February 28 at 212,833 long tons, and increase of 1.6 per cent over January, and 47.9 per cent over February, 1930. Crude rubber afloat for United States ports on February 28 is estimated at 63,680 long tons, as against 56,188 long tons on January 31 and 63,404 long tons on February 28 a year ago.




**World, United States, London, Liverpool, Singapore and Penang Stocks**




**World's Production, U. S. Consumption, and Price of Ribs**

### Foreign Statistics

United Kingdom imports of crude rubber in 1930 amounted to 174,682 long tons, compared with 176,549 tons in 1929; re-exports were 54,613 tons in 1930, compared with 53,742 tons in 1929.

Batavia reported February 26 exports of crude rubber from the Netherlands East Indies during January, 1931, as follows: Java and Madura, 5,923 long tons; Sumatra East Coast, 7,348; other Netherlands East Indies, 10,328, totaling 23,599 long tons. British Malayan imports of crude rubber during February, 1931, were reported as follows from the territories named: Sarawak, 945, and Siam, 409 long tons. Australian December, 1930, imports amounted to 950 long tons. Australia imported, in 1930, 5,354 long tons of crude rubber, compared with 15,886 in 1929. Canada imported during January, 1931, 1,709 long tons of crude rubber.

LONDON STOCKS

| Week Ended | Tons |
|---|---|
| Feb. 28 | 82,185 |
| Mar. 7 | 83,451 |
| Mar. 14 | 83,001 |
| Mar. 21 | 83,132 |

LIVERPOOL STOCKS

| Week Ended | Tons |
|---|---|
| Feb. 28 | 44,776 |
| Mar. 7 | 45,487 |
| Mar. 14 | 47,105 |
| Mar. 21 | 48,333 |

## United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

| Twelve Months | U. S. Net Imports* Tons | U. S. Consumption Tons | U. S. Stocks on Hand§ Tons | U. S. Stocks Afloat‡ Tons | London and Liverpool Stocks§ Tons | Singapore and Penang Stocks§ Tons | World Production (Net Exports) Tons | World Consumption† Tons | World Stocks‡§ Tons |
|---|---|---|---|---|---|---|---|---|---|
| 1925 | 384,837 | 384,644 | 50,985 | 52,421 | 6,328 | 18,840 | 527,600 | 553,300 | 180,850 |
| 1926 | 411,962 | 358,415 | 72,510 | 51,238 | 51,320 | 26,443 | 621,900 | 542,000 | 273,060 |
| 1927 | 431,807 | 372,528 | 100,130 | 47,938 | 66,261 | 25,798 | 607,300 | 593,866 | 298,780 |
| 1928 | 446,421 | 442,227 | 66,166 | 68,764 | 22,603 | 32,905 | 653,837 | 686,945 | 284,198 |
| 1929 | 561,454 | 466,475 | 105,138 | 62,389 | 73,253 | 35,548 | 860,404 | 804,820 | 371,425 |
| 1930 | 488,343 | 375,980 | 200,998 | 56,035 | 120,575 | 46,003 | 815,835 | 702,935 | 492,165 |
| 1931 | | | | | | | | | |
| January | 37,098 | 28,557 | 209,487 | 56,188 | 124,456 | 49,802 | 65,714 | 62,430 | 438,317 |
| February | 36,045 | 28,797 | 212,833 | 63,080 | 128,938 | 49,283 | ..... | ..... | ..... |

* Including liquid latex, but not guayule.
† Comprises U. S. consumption, United Kingdom absorption, and net imports for other countries.
‡ Includes stocks afloat but not in Colombo, Amazon Ports, Amsterdam, and Paris.
§ Stocks on hand the last of the month or year.

# Dominion of Canada Statistics

## Imports of Crude and Manufactured Rubber

| | December, 1930 | | Nine Months Ended December, 1930 | |
|---|---|---|---|---|
| UNMANUFACTURED | Pounds | Value | Pounds | Value |
| Rubber, gutta percha, etc | 3,016,171 | $290,821 | 44,630,576 | $5,470,132 |
| Rubber, recovered | 821,700 | 43,249 | 10,138,800 | 506,552 |
| Rubber and gutta percha scrap | 350,000 | 9,917 | 2,852,800 | 83,494 |
| Balata | 267 | 85 | 15,279 | 5,975 |
| Rubber substitutes | 7,300 | 1,040 | 463,600 | 68,391 |
| Totals | 4,195,438 | $345,112 | 58,101,055 | $6,134,544 |
| PARTLY MANUFACTURED | | | | |
| Hard rubber sheets and rods | 3,043 | $1,166 | 47,066 | $21,706 |
| Hard rubber tubes | ..... | 140 | ..... | 2,904 |
| Rubber thread not covered | 15,094 | 13,095 | 182,167 | 154,369 |
| Totals | 18,137 | $14,401 | 229,233 | $178,979 |
| MANUFACTURED | | | | |
| Belting | ..... | $7,098 | ..... | $105,324 |
| Hose | ..... | 6,007 | ..... | 106,329 |
| Packing | ..... | 3,325 | ..... | 48,633 |
| Boots and shoes *pairs* | 1,303 | 2,296 | 16,487 | 30,630 |
| Clothing, including waterproofed | ..... | 11,912 | ..... | 214,664 |
| Gaskets | ..... | 280 | ..... | 14,570 |
| Gloves | ..... | 1,258 | ..... | 15,439 |
| Hot water bottles | ..... | 1,419 | ..... | 26,312 |
| Tires, bicycle *number* | 1,994 | 1,019 | 25,067 | 11,788 |
| Pneumatic *number* | 4,658 | 22,306 | 27,528 | 247,396 |
| Inner tubes *number* | 2,572 | 2,909 | 11,907 | 15,717 |
| Solid for automobiles and motor trucks *number* | 48 | 1,481 | 721 | 17,583 |
| Other solid tires | ..... | 495 | ..... | 13,791 |
| Mats and matting | ..... | 5,414 | ..... | 74,955 |
| Cement | ..... | 6,156 | ..... | 59,641 |
| Golf balls *dozen* | 699 | 1,763 | 33,824 | 87,820 |
| Heels *pairs* | 92,939 | 2,403 | 905,588 | 28,703 |
| Other rubber manufactures | ..... | 72,589 | ..... | 901,637 |
| Totals | ..... | $150,130 | ..... | $2,020,932 |
| Totals, rubber imports | ..... | $509,643 | ..... | $8,334,455 |

## Exports of Domestic and Foreign Rubber Goods

| | Produce of Canada Value | Re-exports of Foreign Goods Value | Produce of Canada Value | Re-exports of Foreign Goods Value |
|---|---|---|---|---|
| UNMANUFACTURED | | | | |
| Waste rubber | $4,147 | ..... | $59,531 | ..... |
| MANUFACTURED | | | | |
| Belting | $20,160 | ..... | $374,002 | ..... |
| Canvas shoes with rubber soles | 99,907 | ..... | 2,697,960 | ..... |
| Boots and shoes | 227,842 | ..... | 2,212,758 | ..... |
| Clothing, including waterproofed | 4,691 | ..... | 26,072 | ..... |
| Hose | 7,254 | ..... | 164,823 | ..... |
| Tires, bicycle | 13 | ..... | 3,154 | ..... |
| Pneumatic | 853,815 | ..... | 8,566,224 | ..... |
| Inner tubes | 103,173 | ..... | 1,025,237 | ..... |
| Solid | 41 | ..... | 13,675 | ..... |
| Other rubber manufactures | 202,354 | $1,470 | 1,875,566 | $32,925 |
| Totals | $1,519,250 | $1,470 | $16,959,471 | $32,925 |
| Totals, rubber exports | $1,523,397 | $1,470 | $17,019,002 | $32,925 |

# British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for February, 1931:

### Rubber Exports

**Ocean Shipments from Singapore, Penang, Malacca and Port Swettenham.**

| | February, 1931 | |
|---|---|---|
| To | Sheet and Crepe Rubber Tons | Latex Concentrated Latex and Revertex Tons |
| United Kingdom | 8,796 | 22 |
| United States | 26,714 | 44 |
| Continent of Europe | 4,134 | 35 |
| British possessions | 391 | .. |
| Japan | 1,538 | .. |
| Other countries | 277 | .. |
| Totals | 41,850 | 101 |

### Rubber Imports

**Actual Imports by Land and Sea.**

| | February, 1931 | |
|---|---|---|
| From | Dry Rubber Tons | Wet Rubber Tons |
| Sumatra | 446 | 4,492 |
| Dutch Borneo | 300 | 2,071 |
| Java and other Dutch Islands | 41 | 19 |
| Sarawak | 921 | 24 |
| British Borneo | 169 | 14 |
| Burma | 251 | 33 |
| Siam | 232 | 177 |
| French Indo-China | 378 | 23 |
| Other countries | 74 | 7 |
| Totals | 2,812 | 6,860 |

# Rubber Questionnaire

## Fourth Quarter, 1930*

| | Long Tons | | | |
|---|---|---|---|---|
| RECLAIMED RUBBER | Inventory at End of Quarter | Production | Shipments | Consumption |
| Reclaimers solely (6) | 6,643 | 11,712 | 11,665 | ..... |
| Manufacturers who also reclaim (23) | 8,301 | 18,765 | 5,963 | 13,472 |
| Other manufacturers (87) | 3,590 | ..... | ..... | 11,470 |
| Totals | 18,534 | 30,477 | 17,628 | 24,942 |

| | Long Tons | | |
|---|---|---|---|
| SCRAP RUBBER | Inventory | Consumption | Due on Contract |
| Reclaimers solely (6) | 32,485 | 15,405 | 5,040 |
| Manufacturers who also reclaim (21) | 26,869 | 20,973 | 12,212 |
| Other manufacturers (11) | 110 | ..... | ..... |
| Totals | 59,464 | 36,378 | 17,252 |

## Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

| PRODUCTS | Crude Rubber Consumed Long Tons | Total Sales Value of Shipments of Manufactured Rubber Products |
|---|---|---|
| Tires and Tire Sundries | | |
| Automobile and motor truck pneumatic casings | 41,599 | $77,722,000 |
| Automobile and motor truck pneumatic tubes | 8,528 | 11,368,000 |
| Motorcycle tires (casings and tubes) | 35 | 124,000 |
| Bicycle tires (single tubes, casings, and tubes) | 192 | 532,000 |
| Airplane casings and tubes | 15 | 70,000 |
| Solid and cushion tires | 1,060 | 1,568,000 |
| All other solid tires | 53 | 231,000 |
| Tire sundries and repair materials | 802 | 2,699,000 |
| Totals | 52,284 | $94,314,000 |
| Other Rubber Products | | |
| Mechanical rubber goods | 4,117 | $16,801,000 |
| Boots and shoes | 3,226 | 25,228,000 |
| Insulated wire and insulating compounds | 1,140 | †5,732,000 |
| Druggists' sundries, medical and surgical rubber goods | 408 | 2,147,000 |
| Stationers' rubber goods | 295 | 459,000 |
| Bathing apparel | 92 | 162,000 |
| Rubber clothing | 267 | 1,291,000 |
| Automobile fabrics | 155 | 1,012,000 |
| Other rubberized fabrics | 595 | 1,872,000 |
| Hard rubber goods | 267 | †1,546,000 |
| Heels and soles | 1,711 | 4,752,000 |
| Rubber flooring | 262 | 861,000 |
| Sporting goods, toys, and novelties | 479 | 1,604,000 |
| Miscellaneous, not included in any of the above items | 960 | 3,073,000 |
| Totals | 13,974 | $66,540,000 |
| Grand totals—all products | 66,258 | $160,854,000 |

## Inventory of Rubber in the United States and Afloat

| | Long Tons | | | |
|---|---|---|---|---|
| ON HAND | Plantation | Para | All Other | Totals |
| Manufacturers | 127,006 | 2,250 | 319 | 129,575 |
| Importers and dealers | 57,228 | 1,184 | 392 | 58,804 |
| Totals on hand | 184,234 | 3,434 | 711 | 188,379 |
| AFLOAT | | | | |
| Manufacturers | 12,414 | .... | ... | 12,414 |
| Importers and dealers | 31,603 | 259 | 10 | 31,872 |
| Totals afloat | 44,017 | 259 | 10 | 44,286 |

* Number of rubber manufacturers that reported data was 178; crude rubber importers and dealers, 50; reclaimers (solely), 6; total daily average number of employes on basis of third week of October, 1930, was 124,428.

It is estimated that the reported grand total crude rubber consumption and the grand total sales values figures to be approximately 92 per cent; the grand total crude rubber inventory figures 93 per cent, and afloat figures 79 per cent; the reclaimed rubber production 96 per cent, reclaimed consumption 90 per cent, and reclaimed inventory 80 per cent of the total for the entire industry.

† One company did not report its sales but did report crude rubber consumption, stocks, etc.

*Compiled from statistics supplied by the Rubber Manufacturers Association, Inc.*

# Low and High New York Spot Prices

| | March | | |
|---|---|---|---|
| PLANTATIONS | 1931* | 1930 | 1929 |
| Thin latex crepe | $0.07⅜@$0.08⅝ | $0.15⅜@$0.16¼ | $0.22¼@$0.26½ |
| Smoked sheet, ribbed | .07⅛@ .08⅜ | .14⅞@ .15¼ | .21⅝@ .26⅛ |
| PARAS | | | |
| Upriver fine | .09 @ .09⅜ | .16½@ .16¾ | .23 @ .27 |
| Upriver coarse | .07 @ .08 | .07¾@ .08¾ | .13½@ .17½ |
| Upper caucho ball | .07 @ .08 | .08 @ .08½ | .13½@ .17 |

* Figured to March 26, 1931.

# United States Statistics

## Imports of Crude and Manufactured Rubber

| | December, 1930 | | Twelve Months Ended December, 1930 | |
|---|---|---|---|---|
| UNMANUFACTURED—*Free* | Pounds | Value | Pounds | Value |
| Crude rubber | 83,552,327 | $7,175,242 | 1,079,401,502 | $139,069,795 |
| Liquid latex | 155,798 | 20,481 | 10,428,111 | 1,571,339 |
| Jelutong or pontianak | 961,637 | 116,644 | 13,232,241 | 1,403,244 |
| Balata | 201,068 | 66,198 | 1,123,546 | 422,684 |
| Gutta percha | ..... | ..... | 113,210 | 19,831 |
| Guayule | ..... | ..... | 2,455,427 | 347,388 |
| Siak, scrap, and reclaimed | 716,898 | 5,621 | 10,744,275 | 135,249 |
| Totals | 85,587,728 | $7,384,186 | 1,117,498,312 | $142,969,530 |
| Chicle *Dutiable* | ..... | ..... | *8,733,245 | *$4,470,252 |
| Chicle, crude *Free* | 954,195 | $475,418 | †5,223,641 | †$2,551,459 |
| MANUFACTURED—*Dutiable* | | | | |
| Tires *number* | 1,014 | $4,524 | 8,468 | $85,125 |
| Other rubber manufactures | ..... | 108,504 | ..... | 1,242,544 |
| Totals | ..... | $113,028 | ..... | $1,327,669 |

## Exports of Foreign Merchandise

| RUBBER AND MANUFACTURES | | | | |
|---|---|---|---|---|
| Crude rubber | 4,855,640 | $542,197 | 67,660,119 | $9,316,205 |
| Balata | 10,899 | 3,135 | 1,184,369 | 258,544 |
| Gutta percha, rubber substitutes, and scrap | ..... | ..... | 61,386 | 7,779 |
| Rubber manufactures | ..... | 9,129 | ..... | 159,780 |
| Totals | ..... | $554,461 | ..... | $9,742,308 |

## Exports of Domestic Merchandise

| RUBBER AND MANUFACTURES | | | | |
|---|---|---|---|---|
| Reclaimed | 1,547,414 | $82,953 | 21,209,510 | $1,234,190 |
| Scrap and old | 4,969,592 | 104,179 | 52,898,020 | 1,733,675 |
| Rubberized automobile cloth *sq. yd.* | 117,831 | 57,257 | 1,259,441 | 611,577 |
| Other rubberized piece goods and hospital sheeting *sq. yd.* | 103,177 | 48,722 | 1,340,901 | 591,333 |
| Footwear | | | | |
| Boots *pairs* | 62,495 | 134,341 | 968,164 | 2,063,092 |
| Shoes *pairs* | 53,692 | 55,897 | 2,109,064 | 2,439,993 |
| Canvas shoes with rubber soles *pairs* | 261,139 | 168,983 | 4,028,122 | 2,635,039 |
| Soles *doz. pairs* | 10,487 | 31,375 | 134,652 | 388,656 |
| Heels *doz. pairs* | 76,972 | 52,637 | 1,188,051 | 819,598 |
| Water bottles and fountain syringes *number* | 28,340 | 12,987 | 467,394 | 237,482 |
| Gloves *doz. pairs* | 10,119 | 26,897 | 120,668 | 307,351 |
| Other druggists' sundries | ..... | 23,706 | ..... | 338,696 |
| Balloons *gross* | 78,390 | 66,392 | 751,475 | 768,275 |
| Toys and balls | ..... | 8,566 | ..... | 137,334 |
| Bathing caps *doz.* | 1,263 | 2,459 | 159,205 | 340,207 |
| Bands | 33,167 | 14,229 | 567,231 | 261,492 |
| Erasers | 35,002 | 22,368 | 507,125 | 307,901 |
| Hard rubber goods | | | | |
| Electrical goods | 70,583 | 8,201 | 1,250,983 | 172,426 |
| Other goods | ..... | 17,921 | ..... | 360,360 |
| Tires | | | | |
| Truck and bus casings, *number* | 34,675 | 724,658 | 452,593 | 10,063,321 |
| Other automobile casings *number* | 154,070 | 1,219,809 | 2,051,662 | 17,705,557 |
| Tubes, auto *number* | 92,885 | 168,839 | 1,589,898 | 2,694,403 |
| Other casings and tubes *number* | 13,980 | 16,890 | 101,383 | * 249,028 |
| Solid tires for automobiles and motor trucks *number* | 1,225 | 52,532 | 24,601 | 796,302 |
| Other solid tires | 163,873 | 26,882 | 1,513,306 | 256,048 |
| Tire accessories | ..... | 69,648 | ..... | 1,280,308 |
| Rubber and friction tape | 81,349 | 23,047 | 1,500,253 | 414,576 |
| Belting | 290,385 | 148,155 | 4,297,789 | 2,195,424 |
| Hose | 358,686 | 120,479 | 7,291,886 | 2,448,291 |
| Packing | 135,873 | 59,537 | 1,970,846 | 877,111 |
| Thread | 142,623 | 148,168 | 1,626,935 | 1,612,479 |
| Other rubber manufactures | ..... | 143,793 | ..... | 2,566,370 |
| Totals | ..... | $3,862,507 | ..... | $58,907,895 |

* Ending June 17, 1930. † Beginning June 18, 1930.

## Crude Rubber Imports by Customs Districts

Including latex, dry rubber content

| | January, 1931 | | January, 1930 | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Massachusetts | 3,040,824 | $277,785 | 4,442,954 | $735,551 |
| New York | 71,032,238 | 6,359,453 | 96,382,244 | 16,177,031 |
| Philadelphia | ..... | ..... | 1,644,097 | 254,596 |
| Maryland | 136,385 | 10,230 | 90,850 | 15,515 |
| Los Angeles | 7,177,285 | 567,008 | 3,868,212 | 656,442 |
| San Francisco | 242,581 | 22,913 | 181,922 | 30,093 |
| Oregon | 42,560 | 3,595 | 11,252 | 1,760 |
| Ohio | 252,744 | 16,030 | 514,684 | 89,895 |
| Colorado | 56,000 | 4,285 | 168,000 | 27,383 |
| Totals | 81,980,617 | $7,261,299 | 107,304,215 | $17,988,266 |

# United Kingdom Statistics

## Imports

| | January, 1930 | | January, 1931 | |
|---|---|---|---|---|
| UNMANUFACTURED | Pounds | Value | Pounds | Value |
| Crude Rubber | | | | |
| From— | | | | |
| Straits Settlements | 17,309,700 | £565,904 | 14,748,100 | £269,149 |
| Federated Malay States | 6,626,200 | 218,688 | 7,507,700 | 143,367 |
| British India | 1,802,000 | 59,966 | 1,713,900 | 30,659 |
| Ceylon and Dependencies | 4,130,500 | 133,809 | 3,105,900 | 56,562 |
| Java and Dutch Borneo | 2,104,200 | 71,011 | 2,098,800 | 38,254 |
| Sumatra and other Dutch possessions in Indian Seas | 1,992,700 | 63,609 | 1,339,700 | 25,069 |
| Other countries in East Indies and Pacific, not elsewhere specified | 210,100 | 7,319 | 445,300 | 8,138 |
| Brazil | 909,000 | 31,122 | 413,900 | 9,699 |
| South and Central America (except Brazil) | 3,200 | 106 | ..... | ..... |
| West Africa | | | | |
| French West and Equatorial Africa | 100 | 3 | ..... | ..... |
| Gold Coast | 38,100 | 1,254 | 24,100 | 388 |
| Other parts of West Africa | 203,800 | 7,773 | 59,300 | 1,110 |
| East Africa, including Madagascar | 70,200 | 2,205 | 65,000 | 1,146 |
| Other countries | 285,400 | 10,103 | 122,900 | 2,465 |
| Totals | 35,685,200 | £1,172,872 | 31,644,600 | £586,006 |
| Gutta percha and balata | 629,000 | 53,957 | 381,500 | 32,946 |
| Waste and reclaimed rubber | 796,600 | 10,995 | 754,200 | 7,424 |
| †Rubber substitutes, synthetic | 3,200 | 79 | 2,500 | 45 |
| Totals | 37,114,000 | £1,237,903 | 32,782,800 | £626,421 |
| MANUFACTURED | | | | |
| *Tires and tubes | | | | |
| Pneumatic | | | | |
| Outer covers | ..... | £18,885 | ..... | £13,002 |
| Inner tubes | ..... | 4,132 | ..... | 3,223 |
| Solid tires | ..... | 4,446 | ..... | 2,122 |
| Boots and shoes *doz. pairs* | 88,686 | 120,185 | 31,403 | 58,685 |
| Other rubber manufactures | ..... | 211,818 | ..... | 138,707 |
| Totals | ..... | £359,466 | ..... | £215,739 |

## Exports

| UNMANUFACTURED | | | | |
|---|---|---|---|---|
| Waste and reclaimed rubber | 2,130,600 | £18.040 | 1,750,900 | £11,376 |
| †Rubber substitutes, synthetic | 40,700 | 872 | 49,700 | 975 |
| Totals | 2,171,300 | £18.912 | 1,800,600 | £12,351 |
| MANUFACTURED | | | | |
| Tires and tubes | | | | |
| Pneumatic | | | | |
| Outer covers | ..... | £366,874 | ..... | £242,438 |
| Inner tubes | ..... | 51,971 | ..... | 26,670 |
| Solid tires | ..... | 7,666 | ..... | 5,422 |
| Boots and shoes *doz. pairs* | 24,026 | 35,654 | 8,388 | 12,340 |
| Other rubber manufactures | ..... | 218,852 | ..... | 162,540 |
| Totals | ..... | £681,017 | ..... | £449,410 |

## Exports—Colonial and Foreign

| UNMANUFACTURED | | | | |
|---|---|---|---|---|
| Crude Rubber | | | | |
| To— | | | | |
| Soviet Union (Russia) | 2,236,300 | £92,866 | 3,359,700 | £118,985 |
| Sweden, Norway, and Denmark | 203,700 | 8,420 | 169,300 | 3,939 |
| Germany | 3,025,300 | 105,359 | 2,416,000 | 44,027 |
| Belgium | 777,300 | 31,516 | 196,400 | 3,752 |
| France | 2,572,300 | 100,313 | 2,430,700 | 53,759 |
| Spain | 48,200 | 2,240 | 37,000 | 964 |
| Italy | 122,600 | 5,419 | 376,000 | 7,160 |
| Other European countries | 669,300 | 26,267 | 553,200 | 14,474 |
| United States | 1,023,000 | 33,487 | 97,500 | 3,567 |
| Other countries | 129,300 | 6,825 | 213,600 | 5,681 |
| Totals | 10,807,300 | £412.712 | 9,849,400 | £256.308 |
| Gutta percha and balata | 62,600 | 5,053 | 48,700 | 4,760 |
| Waste and reclaimed rubber | 1,200 | 26 | 21,500 | 178 |
| †Rubber substitutes, synthetic | ..... | ..... | ..... | ..... |
| Totals | 10,871,100 | £417,791 | 9,919,600 | £261,246 |
| MANUFACTURED | | | | |
| Tires and tubes | | | | |
| Pneumatic | | | | |
| Outer covers | ..... | £4,035 | ..... | £14,503 |
| Inner tubes | ..... | 471 | ..... | 625 |
| Solid tires | ..... | 60 | ..... | ..... |
| Boots and shoes *doz. pairs* | 833 | 2,743 | 982 | 2,429 |
| Other rubber manufactures | ..... | 7,214 | ..... | 5,640 |
| Totals | ..... | £14,523 | ..... | £23,197 |

* Motor cars, motorcycles, parts, and accessories were liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until April 30, 1926, inclusive, and tires and tubes until April 11, 1927, inclusive.

† Included natural rubber substitutes prior to 1931.

## London Stocks, December, 1930, and January, 1931

| London | Landed for Dec. Tons | Landed for Jan. Tons | Delivered for Dec. Tons | Delivered for Jan. Tons | Stocks Dec. 31, 1930 Tons | Stocks Jan. 31, 1931 Tons |
|---|---|---|---|---|---|---|
| Plantation | 6,363 | 7,624 | 5,229 | 4,545 | 77,912 | 80,991 |
| Other grades | .... | 16 | .... | 21 | 54 | 49 |
| Liverpool | | | | | | |
| Plantation | †2,900 | †3,917 | †2,069 | †1,174 | †40,549 | †43,292 |
| Total tons, London and Liverpool | 9,263 | 11,557 | 7,298 | 5,740 | 118,515 | 124,332 |

† Official returns from the recognized public warehouses.

## Principal Rubber Stocks

Long Tons

| | 1930 Aug. | Sept. | Oct. | Nov. | Dec. | 1931 Jan. |
|---|---|---|---|---|---|---|
| Malay Estates | 26,430 | 26,573 | 25,663 | 26,028 | 25,837 | 25,770 |
| S. S. Dealers | 41,513 | 36,618 | 34,479 | 36,884 | 39,610 | 42,202 |
| Other Malay Dealers | 13,052 | 13,290 | 12,924 | 14,523 | 15,082 | 15,850 |
| Malayan Ports | 5,877 | 6,830 | 4,734 | 4,016 | 5,569 | 6,104 |
| Totals | 86,872 | 83,311 | 77,800 | 81,451 | 86,098 | 89,926 |
| London | 80,931 | 83,329 | 77,647 | 76,887 | 78,013 | 81,050 |
| Liverpool | 29,670 | 34,718 | 38,848 | 39,718 | 40,549 | 43,500 |
| Totals | 110,601 | 118,047 | 116,495 | 116,605 | 118,562 | 124,550 |
| U. S. Inventory | 162,283 | 171,285 | 188,310 | 193,091 | 201,000 | 207,883 |
| U. S. Afloat | 62,149 | 64,000 | †50,441 | †51,837 | †55,288 | †55,439 |
| Europe Afloat | 30,310 | 31,000 | 27,630 | 24,220 | 25,980 | *26,000 |
| Totals | 92,459 | 95,000 | 78,071 | 76,057 | 81,268 | 81,439 |
| Grand totals | 452,215 | 467,643 | 460,676 | 467,204 | 486,928 | 503,798 |

*Provisional figure subject to revision.

†Rubber Manufacturers Association, Inc., figure, raised from estimated 75 per cent to 100 per cent.

*Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

## United States Imports of Crude Rubber and Related Gums

| | 1929 Quantity Pounds | Value Dollars | Unit Value Cents | 1930 Quantity Pounds | Value Dollars | Unit Value Cents |
|---|---|---|---|---|---|---|
| Rubber and latex | 1,262,938,646 | 240,966,170 | 19.08 | 1,089,829,613 | 140,641,134 | 12.90 |
| Guayule | 2,857,000 | 545,175 | 19.08 | 2,455,427 | 347,388 | 14.15 |
| Jelutong | 18,376,413 | 2,458,126 | 13.38 | 13,232,241 | 1,403,244 | 10.60 |
| Balata | 1,630,642 | 566,964 | 34.77 | 1,123,546 | 422,684 | 37.62 |
| Gutta-Percha | 1,000,580 | 167,479 | 16.74 | 113,210 | 19,831 | 17.52 |
| Gutta Siak | 22,440 | 4,897 | 21.82 | ..... | ..... | .... |
| Scrap and Reclaimed | 20,160,277 | 391,635 | 1.94 | 10,744,275 | 135,249 | 1.26 |

## Ceylon Rubber Exports

January 1 to December 17, 1930

| To | Tons |
|---|---|
| United Kingdom | 16,846.61 |
| Continent | 9,328.33 |
| Other countries in Europe | 120.39 |
| Australia | 1,371.98 |
| America | 45,968.04 |
| Canada and Newfoundland | 2.50 |
| Other countries in America | 151.13 |
| Egypt | 11.00 |
| Africa | 13.59 |
| India | 90.21 |
| China | .90 |
| Japan | 275.31 |
| Other countries in Asia | 3.29 |
| Total | 74,183.28 |
| For the same period last year | 78,559.18 |

Annual Exports, 1922-1929

| | Tons |
|---|---|
| For the year 1929 | 80,219.25 |
| 1928 | 57,825.48 |
| 1927 | 55,355.77 |
| 1926 | 58,799.56 |
| 1925 | 45,697.19 |
| 1924 | 37,351.13 |
| 1923 | 37,111.88 |
| 1922 | 47,367.14 |

# Rubber Goods Production Statistics

| Tires and Tubes | 1931 | 1930 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pneumatic casings | Jan. | Dec. | Nov. | Oct. | Sept. | Aug. | July | June | May | Apr. | Mar. | Feb. | Jan. |
| Production ....thousands | 2,930 | 2,251 | 2,123 | 2,866 | 2,692 | 3,332 | 3,193 | 4,098 | 4,574 | 4,518 | 3,891 | 3,645 | 3,589 |
| Stocks, end of month....thousands | 7,166 | 7,203 | 7,676 | 7,842 | 7,849 | 8,678 | 9,449 | 10,622 | 10.745 | 10,461 | 1,010 | 9,929 | 9,539 |
| Shipments | | | | | | | | | | | | | |
| Domestic ....thousands | 2,855 | 2,550 | 2,119 | 2,613 | 3,360 | 3,976 | 4,229 | 4,050 | 3,960 | 3,886 | 3,587 | 3,150 | 3,348 |
| Export ....thousands | 140 | 139 | 148 | 186 | 165 | 164 | 129 | 185 | 213 | 186 | 186 | 206 | 178 |
| Inner tubes | | | | | | | | | | | | | |
| Production ....thousands | 2,898 | 2,448 | 2,144 | 3,161 | 3,053 | 3,837 | 3,151 | 3,960 | 4,428 | 4,408 | 3,953 | 3,707 | 3,685 |
| Stocks, end of month....thousands | 7,552 | 7,999 | 8,250 | 8,414 | 8,052 | 8,589 | 9,326 | 10,889 | 11,082 | 11,028 | 10,543 | 10,429 | 10,163 |
| Shipments | | | | | | | | | | | | | |
| Domestic ....thousands | 3,147 | 2,634 | 2,147 | 2,659 | 3,525 | 4,492 | 4,594 | 4,082 | 3,940 | 3,769 | 3,682 | 3,344 | 3,778 |
| Export ....thousands | 102 | 96 | 84 | 119 | 108 | 118 | 90 | 131 | 119 | 109 | 99 | 126 | 107 |
| Solid and cushion | | | | | | | | | | | | | |
| Production ....thousands | 13 | 13 | 13 | 18 | 14 | 16 | 13 | 17 | 17 | 17 | 19 | 22 | 25 |
| Stocks, end of month....thousands | 75 | 76 | 76 | 78 | 82 | 90 | 101 | 107 | 108 | 117 | 123 | 128 | 127 |
| Shipments | | | | | | | | | | | | | |
| Domestic ....thousands | 12 | 12 | 13 | 19 | 22 | 22 | 19 | 18 | 23 | 23 | 22 | 19 | 20 |
| Export ....thousands | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 |
| Other Rubber Products | | | | | | | | | | | | | |
| Rubber-proofed fabrics, production | | | | | | | | | | | | | |
| Total ....thous. of yds. | .... | 1,909 | 2,822 | 5,209 | 5,046 | 3,458 | 2,940 | 3,379 | 3,597 | 4,029 | 3,570 | 3,441 | 3,281 |
| Auto fabrics ....thous. of yds. | 577 | 476 | 532 | 915 | 733 | 678 | 608 | 851 | 1,239 | 1,368 | 727 | 885 | 966 |
| All other ....thous. of yds. | .... | 736 | 864 | 1,254 | 1,064 | 975 | 917 | 1,042 | 1,025 | 1,071 | 1,211 | 1,081 | 1,076 |
| Raincoat fabrics ....thous. of yds. | .... | 697 | 1,426 | 3,040 | 3,249 | 1,805 | 1,415 | 1,486 | 1,333 | 1,590 | 1,632 | 1,475 | 1,239 |
| Rubber heels | | | | | | | | | | | | | |
| Production ....thous. of pairs | 12,973 | 13,101 | 11,083 | 16,460 | 14,322 | 13,735 | 15,117 | 15,795 | 15,603 | 17.762 | 15,439 | 14,172 | 15,470 |
| Shipments | | | | | | | | | | | | | |
| To shoe manufacturers....thous. of pairs | 8,471 | 6,618 | 4,578 | 9,354 | 9,244 | 8,813 | 11,668 | 10,287 | 7,432 | 9,201 | 8,458 | 8,837 | 10,989 |
| To repair trade....thous. of pairs | 3,939 | 3,450 | 4,473 | 8,291 | 6,681 | 6,622 | 5,053 | 5,186 | 5,221 | 4,641 | 7,189 | 6,511 | 5,106 |
| For export ....thous. of pairs | 748 | 838 | 880 | 966 | 1,083 | 780 | 938 | 829 | 776 | 1,096 | 956 | 1,031 | 1,049 |
| Stocks, end of month....thous. of pairs | 30,302 | 29,741 | 29,130 | 29,353 | 31,601 | 33,226 | 36,220 | 38,852 | 38,595 | 37,618 | 36,541 | 38,250 | 40,528 |
| Rubber soles | | | | | | | | | | | | | |
| Production ....thous. of pairs | 2,588 | 3,021 | 1,426 | 3,056 | 2,193 | 1,473 | 2,663 | 2,734 | 1,939 | 2,593 | 2,582 | 2,338 | 3,496 |
| Shipments | | | | | | | | | | | | | |
| To shoe manufacturers....thous. of pairs | 2,197 | 2,305 | 1,011 | 2,638 | 1,691 | 1,161 | 2,627 | 2,549 | 1,506 | 1,956 | 2,055 | 1,973 | 3,261 |
| To repair trade....thous. of pairs | 287 | 243 | 280 | 492 | 333 | 317 | 364 | 309 | 332 | 380 | 407 | 392 | 491 |
| For export ....thous. of pairs | 11 | 58 | 60 | 82 | 74 | 74 | 34 | 31 | 27 | 28 | 54 | 56 | 138 |
| Stocks, end of month....thous. of pairs | 3,032 | 2,917 | 2,390 | 2,520 | 2,729 | 2,289 | 2,876 | 3,307 | 3,019 | 3,272 | 3,349 | 3,171 | 3,227 |
| Mechanical rubber goods | | | | | | | | | | | | | |
| Shipments | | | | | | | | | | | | | |
| Total ....thous. of dolls | .... | 3,338 | 3,400 | 4,186 | 4,083 | 4,552 | 4,910 | 5,318 | 6,163 | 5,989 | 5,981 | 5,376 | 5,169 |
| Belting ....thous. of dolls | .... | 675 | 779 | 954 | 1,045 | 1,248 | 1,364 | 1,238 | 1,310 | 1,309 | 1,379 | 1,281 | 1,150 |
| Hose ....thous. of dolls | .... | 1,337 | 1,276 | 1,554 | 1,473 | 1,682 | 1,856 | 2,199 | 2,703 | 2,593 | 2,500 | 2,190 | 2,034 |
| All other ....thous. of dolls | .... | 1,326 | 1,345 | 1,678 | 1,565 | 1,622 | 1,690 | 1,881 | 2,150 | 2,087 | 2,101 | 1,905 | 1,984 |
| Rubber bands, shipments....thous. of lbs. | 211 | 165 | 165 | 197 | 172 | 164 | 174 | 177 | 211 | 197 | 248 | 230 | 226 |
| Rubber flooring, shipments....thous. of sq. ft. | 365 | 597 | 432 | 682 | 529 | 559 | 507 | 634 | 615 | 570 | 533 | 530 | 459 |
| Calendered rubber clothing | | | | | | | | | | | | | |
| Production ....no. coats and sundries | .... | 20,791 | 22,623 | 41,291 | 37,097 | 44,952 | 38,582 | 55,411 | 75,719 | 86,471 | 78,858 | 64,934 | 56,949 |
| Net orders ....no. coats and sundries | .... | 12,881 | 15,493 | 25,082 | 39,364 | 26,348 | 28,767 | 21,249 | 110,520 | 89,862 | 97,612 | 39,568 | 31,638 |

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.

# Ceylon Notes

(*Continued from page 92*)

independent of the climate and also because by this method a thick crepe can be manufactured and a greater output obtained from the mills. Another advantage of artificial heating is the development of mold on crepe even in cold and rainy weather is practically nil.

In the main the methods of preparation are the same for the three countries although differences in detail have developed. Thus while in Java aluminum latex cups are used, these are not favored in Malaya because they quickly become hot in immature areas; consequently porcelain or glazed earthenware cups are used. In Ceylon the latex cup is a coconut shell.

More than 90 per cent of the estates in Java use formic acid for coagulation, but in Malaya and Ceylon a comparatively large amount of acetic acid is still being used. The coagulum is machined the day following the addition of acid in preparing sheet rubber in Ceylon and Malaya, but in Java machining is carried out on the same day as the addition of the acid. The wet sheets are allowed to drip in the shade for about an hour in Ceylon and Malaya, but in Java they are soaked overnight in water and then allowed to drip. This soaking process is said to prevent the development of mold. The other two countries use paranitrophenol to prevent mold. This is not necessary in Java.

The method of machining crepe is similar in Java and Malaya, but in Ceylon a thin lace crepe is prepared which is blanketed when dry.

Owing to local modifications in the method of preparation certain differences appear in the vulcanizing properties of rubber in the three countries; the most striking is likely to occur in the case of smoked sheet. That from Java probably vulcanizes more slowly than that from Ceylon or Malaya owing to the fact that in the former country sheet is machined soon after coagulation, is soaked in water overnight, and is heavily smoked.

To obtain a more uniform product, bulking on a large scale should be encouraged; and when standard methods of preparation are found to yield a material with abnormal vulcanizing and mechanical properties, the method of preparation should be modified.

The information contained in the above report is of practical value in connection with the attempts now being made in Ceylon to encourage the preparation of uniform rubber throughout the country.

It is expected that as the area of budded rubber increases, variations in the properties of rubber will probably decrease.

## United States Crude and Waste Rubber Imports for 1931 by Months

| | Plantations | Latex | Paras | Africans | Centrals | Guayule | Manicobas and Matto Grosso | Totals 1931 | Totals 1930 | Balata | Miscellaneous | Waste |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January ..... *tons* | 36,525 | 206 | 331 | 36 | .. | .. | .. | 37,098 | 47,362 | 65 | 960 | 38 |
| February ..... | 35,749 | 339 | 516 | 40 | 1 | .. | .. | 36,645 | 43,728 | 1 | 580 | .. |
| Total, two months, 1931..... *tons* | 72,274 | 545 | 847 | 76 | 1 | .. | .. | 73,743 | ..... | 66 | 1,540 | 38 |
| Total, two months, 1930..... *tons* | 88,552 | 637 | 1,535 | 142 | 24 | 200 | .. | ..... | 91,090 | 257 | 1,291 | 179 |

*Compiled from Rubber Manufacturers Association statistics.*

## Tire Production Statistics

Pneumatic Casings—All Types

| | Inventory | Production | Total Shipments |
|---|---|---|---|
| 1928 ..... | 10,217,708 | 58,457,873 | 55,721,937 |
| 1929 ..... | 9,470,368 | 54,980,672 | 55,515,884 |
| 1930 ..... | 7,202,750 | 40,772,378 | 42,913,108 |
| 1931 | | | |
| January ..... | 7,165,846 | 2,939,702 | 2,995,479 |

Solid and Cushion Tires

| | Inventory | Production | Total Shipments |
|---|---|---|---|
| 1928 ..... | 152,120 | 508,223 | 512,602 |
| 1929 ..... | 122,200 | 407,347 | 436,027 |
| 1930 ..... | 75,871 | 204,340 | 250,635 |
| 1931 | | | |
| January ..... | 75,205 | 12,631 | 13,072 |

Inner Tubes—All Types

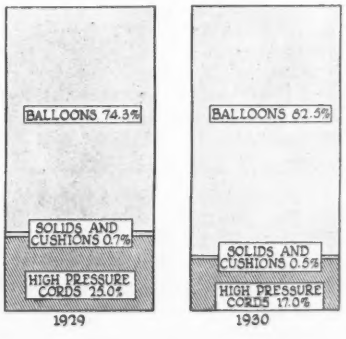
| | Inventory | Production | Total Shipments |
|---|---|---|---|
| 1928 ..... | 12,087,464 | 60,131,381 | 57,845,189 |
| 1929 ..... | 10,245,365 | 55,062,886 | 56,473,303 |
| 1930 ..... | 7,999,477 | 41,936,029 | 43,952,139 |
| 1931 | | | |
| January ..... | 7,551,503 | 2,898,405 | 3,249,734 |

| | Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds | Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Crude Rubber Pounds | Consumption of Motor Gasoline (100%) Gallons |
|---|---|---|---|
| 1928 ..... | 222,243,398 | 600,423,401 | 13,633,452,000 |
| 1929 ..... | 208,824,653 | 598,994,708 | 14,748,552,000 |
| 1930 ..... | 158,812,462 | 476,755,707 | 16,200,894,000 |
| 1931 | | | |
| January ..... | 12,738,467 | 36,318,980 | 1,127,532,000 |

*Rubber Manufacturers Association figures representing 80 per cent of the industry since January, 1929, with the exception of gasoline consumption.*

### Tire and Rubber Data

| | 1930 | 1929 | 1928 | 1927 | 1926 |
|---|---|---|---|---|---|
| Crude rubber consumption for casings, solid tires and tubes—millions of pounds..... | 596 | 805 | 800 | 687 | 691 |
| Cotton fabric consumption for tires—millions of pounds ..... | 198 | 281 | 296 | 237 | 221 |
| Total pneumatic tire production—hundred thousands | 510 | 747 | 779 | 644 | 615 |
| Solid and cushion tire production—thousands..... | 255 | 553 | 684 | 744 | 750 |
| Inner tube production—hundred thousands..... | 524 | 746 | 803 | 708 | 766 |




*Data and illustrations through courtesy of "Automotive Industries."*

# FINANCIAL

## United States Rubber Co.

TO THE STOCKHOLDERS: During the year ended December 31, 1930, your company has continued with the reorganization of its general financial and business structure and has carried out many changes in connection with the realinement of its production and distribution activities. It is natural that this has seriously affected the results for the year, but with the return of better business conditions the benefits to be derived from the reorganization will be evident.

Eleven factories were closed during the year, and their manufacturing operations were concentrated in more modern units. Four factories were sold, and the remainder are being offered for sale or are being rented. Improvements in selling and distributing operations have been made, and further changes are in process of completion.

Early in 1931 your company acquired an interest in the Samson Tire & Rubber Corp., Los Angeles, Calif., and in the Gillette Rubber Co., Eau Claire, Wis. These companies have modern facilities for the manufacture of tires and tire products, and their output and distribution will augment our activities in this important field.

Net sales for the year amounted to $157,074,760 after all discounts and allowances. Sales were $192,962,040 for the year 1929. Sales of all products suffered by reason of the adverse business conditions. Selling prices have been generally lower in all lines.

Sales of waterproof footwear and clothing have been adversely affected by weather conditions which have continued into the present season. Minor lines of felt and leather footwear were discontinued during the year. Sales of tires were lower in dollar value due to lower selling prices.

Net profit from operations for the year, after interest on funded indebtedness of $5,576,791, but before provision for depreciation, pensions, and book adjustments, amounted to $928,882. Provision for depreciation and obsolescence amounted to $7,347,183, compared with $6,643,148 for 1929 and $5,152,727 for 1928. Payments to pensioned employes of $832,249 were absorbed in current operations and, in addition, a reserve for future pension liability was provided in the amount of $540,126. Dividends on minority stocks were $21,714.

All inventories of raw materials, goods in process of manufacture and finished goods, as well as commitments, were adjusted to the lowering of cost or market prices of the component raw materials. These adjustments as well as provision for contingencies and all other adjustments of book values amounted to $11,083,799. The charges to surplus amounting to $18,063,941 resulted in a deficit of $7,120,056 on December 31, 1930.

Net current assets, after deducting current and accrued liabilities, amount to $72,418,637. No current bank loans were outstanding.

Provision has been made for the issuance of 100,000 shares of common stock at $35 per share to the trustees of the managers' shares plan as approved by the stockholders in October, 1929. No distribution of profits under the bonus or managers' shares plans of the company was made during the year since earnings were not available.

Expenditures for new buildings and machinery amounted to $8,162,284. Provision for depreciation, as above stated, amounting to $7,347,183, and sales of properties and disposition of obsolete equipment having a book value of $8,142,614, caused a reduction in the net value of properties, plants, and equipment of $7,327,513 for the year. The net value on December 31, 1930, was $94,056,883. On December 31, 1929, it was $101,384,396 and on December 31, 1928, it was $105,098,009.

Trade acceptances and drafts against export shipments, discounted by subsidiary companies and outstanding as of December 31, 1930, amounted to $1,498,274. This amount was $1,426,726 on December 31, 1929.

On June 1, 1930, the company sold $15,000,000 of 6 per cent secured gold notes due June 1, 1933. With the proceeds thereof and cash in hand, the $18,136,000 of 7½ per cent secured gold notes, which were outstanding on June 30, 1930, were paid on August 1, 1930. By operation of the sinking funds and by serial note maturity, other funded indebtedness was reduced $2,984,000, making a total reduction in funded indebtedness of $6,120,000 during the year.

The item of goodwill, patents, etc., which is carried on the books of the company at $58,925,372, and the deficit of $7,120,056, have been deducted from the book value of the common stock. The net worth of the 1,464,371 shares of no par value was $32,690,182 or $22.32 a share on December 31, 1930.

All inventories of finished goods, goods in process of manufacture, and raw materials, as well as commitments, have been valued at cost or market, whichever was lower. These inventories amounted to $44,050,098 on December 31, 1930, and had been $57,499,934 on December 31, 1929, a reduction of $13,449,836.

The company closed the year in a satisfactory financial position as indicated by a ratio of current assets to current liabilities of 7.17 to 1.

The operations of the plantations may be considered as satisfactory in view of the decline in the market price of crude rubber, which fell from 16 cents a pound at the first of the year to a low of 7⅜ cents and to 8⅛ cents a pound on December 31, 1930. There was a profit of $71,605 before provision for depreciation and amortization of $1,287,052 and after including non-recurring charges of $486,926. This resulted in a charge to surplus of $1,215,447 for the year.

The net value of the plantations properties is carried on their books at $27,004,161. Approximately 99,500 acres have been planted and the average book value of such planted acres is $271.40. Production for the year amounted to 36,620,000 pounds, compared with 32,971,000 pounds in 1929. There are 70,000 acres in bearing, so that the average yield per acre at present is 523 pounds.

F. B. DAVIS, JR.,
Chairman.

1790 Broadway, N. Y.
March 4, 1931.

## Dividends Declared

| Company | Stock | Rate | Payable | Stock of Record |
|---|---|---|---|---|
| Aetna Rubber Co. | Pfd. | $1.75 q. | Apr. 1 | Mar. 14 |
| Dominion Rubber Co., Ltd. | Pfd. | $1.75 q. | Mar. 31 | Mar. 20 |
| Goodyear Tire & Rubber of California | Pfd. | $0.25 q. | Apr. 20 | Apr. 3 |
| General Tire & Rubber Co. | Pfd. | $1.50 q. | Apr. 1 | Mar. 20 |
| Firestone Tire & Rubber Co. | Com. | $1.75 q. | Apr. 1 | Mar. 20 |
| Goodyear Tire & Rubber of Can., Ltd | Com. | $1.25 q. | Apr. 1 | Mar. 14 |
| Goodyear Tire & Rubber of Can., Ltd | Pfd. | $1.75 q. | Apr. 1 | Mar. 14 |

## New Incorporations

R. V. AFFLERBACH RUBBER CO., Jan. 26 (N. J.,) $125,000. R. Afflerbach, 19 Wilmer St., Metuchen, N. J.; H. Afflerbach, 95 Fayette St., and E. Donovan, 225 State St., both of Perth Amboy, N. J. Principal office, 175 Smith St., Perth Amboy, N. J. Manufacture steam, suction, and garden hose, belting, and packing.

AIRIAN PRODUCTS CORP., Nov. 19 (N. J.), 3,200 shares common stock. Principal office, 71 Condict St., Jersey City, N. J. Manufacture pneumatic cushions, etc.

ENGLERT TIRE & RUBBER CO., Dec. 26 (Del.), capital stock 250 shares common par value $100. W. I. N. Lofland, Wm. Virdin, and D. C. Clough, all of Dover, Del. Manufacture, purchase, and sell tires, tubes, accessories, and all kinds of rubber goods and supplies.

MASTER MAT CO., (N. Y.), S. W. Laveen and J. J. Giel, both of 350 Broadway, New York, N. Y. Manufacture and deal in rubber mats, matting, and stair treads, etc.

## Gutta Alco

Gutta alco is artificial gutta percha produced by patented processes.[1] As shown by the following data, this material is said to be equal or even superior to natural gutta percha. Tests of gutta alco show: specific gravity about unity; softening point 80° C measured by method of Kraemer and Sarnow; insulation resistance at 1,000 V. $5.10^{13}$ to $1.10^{14}$ Ohm per $cm^3$ per mm.

Dielectric constant (specific inductive capacity) at $w = 5{,}000$ is 2.6 to 2.7. Dielectric loss: At $w = 5{,}000$, the loss angle is 25 minutes.

This gutta is recommended for the insulation of telephone cables and submarine cables.

[1] E. S. Ali-Cohen, British Patent No. 313,373, U. S. A. No. 1,739,566, France No. 661,178, Netherlands No. 22,026, and Germany A.55,227 (applied for).